

SewGlo™ White Paper



Introduction

SewGlo™ Electroluminescent thread, a groundbreaking lighting technology, has carved an exciting path across multiple industries with its versatile application potential, aesthetic beauty and safe use. This advanced technology offers a wide range of benefits, making it one of the most sought-after lighting options for today's wearable market, among many other industries. This white paper elucidates the concept, usage, advantages, popular applications, safety considerations, brightness levels and emerging business opportunities of SewGlo™ Electroluminescent thread.

What is SewGlo™ Electroluminescent thread?

SewGlo™ Electroluminescent thread, a novel advancement in lighting technology, is a thin copper wire coated with a phosphor layer that illuminates when an alternating current is applied. The thread is flexible and can be sewn into fabrics, enabling the creation of dynamic and vibrant light displays on soft surfaces.

How to Use It?

Utilizing SewGlo™ Electroluminescent thread is straightforward and seamless, even for those who might not consider themselves technically inclined. The procedure is as easy as using regular thread, with some additional but simple steps for powering the thread.

To begin, it's critical to understand that SewGlo™ thread is not stitched in the exact same manner as conventional thread. Standard thread, when being embroidered or stitched, are able to be pierced or even have the fibers separated when being sewn. With SewGlo™ thread, if the thread is pierced, it can cause a short in the lighting

element, causing the light to cease to function. As such, proper care should be taken depending on the method of attachment.

There are a variety of techniques and tools you can use to secure SewGlo™ thread to the chosen material:

1. **Sewing Machines:** Most standard sewing machines can be used to stitch SewGlo™ threads into fabric. The process involves laying the SewGlo™ thread onto the fabric in a fashion where the needle does not double back in the exact same position. It is recommended to use a zig-zag stitch to ensure the SewGlo™ thread is firmly attached to the fabric without damaging it or doubling back on itself.
2. **Embroidery Machines:** For intricate and complex designs, embroidery machines can offer a high degree of precision. While this method requires a higher level of skill, it allows for more elaborate designs and patterns. Similar to machine stitching, special settings will need to be used, so the machine does not repeat stitches. Most higher end embroidery machines allow for these settings to be made.
3. **Hand Stitching:** For those who prefer a more hands-on approach or for intricate designs where personal precision is required, hand stitching is an excellent option. Thimbles or needle pullers might come in handy to push needles through tough spots or thick fabrics. This method also provides a therapeutic, artisanal touch to the creation process.

Remember that the SewGlo™ thread itself *can* be put through the needle or the sewing machine's tension discs, however special tension may be required for proper installation so it does not break on the machine. Some trial and error may be required for best results.

Once the SewGlo™ thread has been sewn into the fabric, the ends are then connected to a power source, usually a compact battery-powered inverter. This is what enables the thread to illuminate. It's important to note that **ONLY ONE END** of the thread needs to be properly exposed and cleaned for the electrical connection to

be made, if the length is one continuous section. If multiple threads are used, then each length of thread that is cut would need to have the connection made.

Making a Connection

1. Preparing the Connection: To prepare the thread for connection with a 2-conductor wire, peel back the outer sheath to expose the inner phosphor-coated core. To do this, first take about 1-2" (25-50mm) of the thread and let it sit into a high percentage of isopropyl alcohol (recommended 90% or more) for approximately 30 seconds.
 - a. Remove the tip from the alcohol and with your fingers massage toward the end of the wire numerous times, removing the sheathing on the thread.
 - b. Once the sheathing is massaged off, the 2-conductors of the thread are exposed. Gently twist counterclockwise pulling apart the two conductors. When done properly, the conductor fibers should be able to pull off easily and unwrap itself.
 - c. Once the two conductors are separated, take a lighter and burn off the phosphor-coated on the larger conductor. Blow off quickly before it reaches the other conductor.
2. Making the Connection: Once the thread and the 2-conductor wire are prepared, you're ready to make the connection. Connect one end of the 2-conductor wire to the phosphor-coated core, and the other end to the outer conductive sheath of the SewGlo™ thread.
3. Soldering: Next step is to solder the connections, which will ensure a solid and secure connection between the threads and the wire. Make sure to ONLY solder the main conductor (phosphor coated wire). For the fibrous conductor, use only a glue for best results. After soldering, it's crucial to insulate the connections to avoid any electric short circuit. Heat shrink, electric tape, or silicone can be used to seal and insulate the connections.
4. Connecting to a Power Source: Once the thread is integrated into your design and the soldering is complete, you can connect the opposite side of the 2-conductor wire to a power source or inverter. Inverters are essential for

transforming the DC power from your battery into the AC power required to light up the SewGlo™ thread.

Once you power on the inverter, your SewGlo™ thread will light up, transforming electrical energy into visible light. This property allows designers to create captivating, complex and dynamic light patterns with ease.

Remember, while the SewGlo™ thread is durable and flexible, care must be taken during the connection and soldering process to avoid damage. Moreover, always make sure the insulation is properly done to prevent any short-circuits or potential hazards. With these measures in place, the sky's the limit for what you can create with SewGlo™ threads!

Advantages of the Technology

SewGlo™ thread is a revolution in lighting technology, unparalleled by any current alternatives like LEDs or EL wire. This unique technology comes with a host of advantages, making it a favorable choice across various sectors.

1. **Flexibility and Versatility:** The thread's flexibility allows it to be integrated into a variety of materials, from clothing to props, opening a world of creative exploration. In comparison, LEDs are rigid and lack the pliability necessary for intricate designs or to be embedded seamlessly into soft materials.
2. **Unnoticeable When Off:** Unlike EL Wire, which can look unattractive when turned off or viewed up close, SewGlo™ threads retain the aesthetic appeal of the garment or material they are integrated with. The thread is essentially invisible when not illuminated, allowing it to blend into the fabric seamlessly. Because SewGlo™ thread comes in various colors, the color in the “off” position can even be used as detailed stitching to enhance the wearable design.

3. **Washability:** A significant advantage of SewGlo™ thread over LEDs and EL Wire is its washability. Once properly sealed and protected, garments or materials with SewGlo™ thread can be cautiously washed, making it more practical for everyday usage.
4. **Energy Efficiency:** SewGlo™ threads consume less power compared to traditional lighting solutions, bolstering their energy efficiency and making them ideal for applications where power availability is a limitation.
5. **Durability:** These threads can withstand bending and twisting stresses that would easily damage or break LEDs, making them an excellent choice for applications that require durability and resilience.
6. **Lightweight:** SewGlo™ threads are extremely lightweight, reducing the burden on the wearer or the object they are attached to. This is particularly beneficial in the fashion and entertainment industry, where comfort is as significant as visual appeal.
7. **Ease of Use:** Even with minimal technical knowledge, a user can successfully embed SewGlo™ threads into their desired objects. This ease of use extends the technology's reach to a broader user base, from professional designers to DIY enthusiasts.
8. **Unique Aesthetics:** SewGlo™ threads provide a soft, enchanting glow that is visually different from the harsher light emanated by LEDs. This unique lighting effect can create a magical ambiance in clothing, décor, art installations, and more.
9. **No Viable Alternative:** Currently, there is no other lighting technology that can match the benefits offered by SewGlo™ thread. The combination of flexibility, efficiency, washability, ease-of-use and pleasing aesthetics make it a one-of-a-kind solution for many lighting needs.

In essence, the advantages of SewGlo™ thread over other lighting solutions are manifold. The technology's diverse applications, coupled with its unique properties, make it an exciting field for businesses, artists, and technology enthusiasts alike. With SewGlo™ thread, the potential for creativity and innovation truly knows no bounds.

Top 10 Uses of SewGlo™ thread

1. Fashion and Wearables: SewGlo™ threads are widely used in the fashion industry to create luminous clothing, costumes, pet fashion, and accessories.
2. Home Décor: For an innovative touch to the living spaces, SewGlo™ threads can be used in home décor items like wall hangings, pillow covers, chairs, couches and more.
3. Event Décor: Events and weddings use SewGlo™ threads for creating eye-catching décor items.
4. Movie Production: Hollywood uses this technology to create futuristic lighting effects in their films.
5. Stage Performances: Dancers and artists use costumes designed with SewGlo™ threads for a more dramatic and vibrant performance.
6. Safety Gear: The threads can be used in safety vests and other gear to enhance visibility at night.
7. Cosplay: SewGlo™ threads can illuminate cosplay costumes, adding a dynamic element.
8. Car Interiors: For a more personalized and high-tech look, SewGlo™ threads can be used in car interiors like arm rests, seat backs, headliners, trunks (or frunks), and more.
9. Advertizing: Innovative sign boards and posters illuminated with SewGlo™ threads can attract more customer attention.
10. Art Installations: Artists often incorporate SewGlo™ threads in their art pieces for an added light element. This can give a different appearance during the day, and at night.

Safety Concerns

While SewGlo™ thread is generally considered a safe lighting source, there are several significant safety considerations that should be strictly followed to avoid any potential hazards.

1. **Low Shock Risk:** SewGlo™ thread operates at low current levels, significantly minimizing the risk of electrical shocks. However, this does not eliminate the possibility completely, especially if the thread comes in direct contact with the skin.
2. **Avoid Skin Contact:** It is crucial to avoid direct contact of the SewGlo™ thread with skin. The thread, when powered, can produce a tiny amount of vibration that might cause discomfort if in direct contact with skin during prolonged usage. More importantly, direct skin contact risks the exposure to electrical current. Therefore, always ensure that the thread is sewn into or placed on non-conductive materials and never touches the skin directly.
3. **Water Resistance:** SewGlo™ threads are not completely water-proof. While the thread can be washed, care should be taken to minimize the amount of water or any other liquid to prevent potential short-circuits or damage over time. For instance, SewGlo™ is recommended to hand wash, and hang dry. This prolongs the usage and brightness of the product over time. In addition, many batteries are not waterproof, so making sure the battery pack or inverter is removed prior to being washed is likely important.
4. **Use Specific Battery Packs:** It is compulsory to use specific battery packs designed specifically to work with SewGlo™ thread. These battery packs are designed with appropriate voltage levels and safety measures to ensure the SewGlo™ threads perform optimally without any risks. Using other unverified power sources may lead to overheating, short-circuit, or even fire hazards.
5. **Handle With Care:** Although SewGlo™ threads are quite durable, rough handling can cause them to break or malfunction. Care should also be taken not to knot or excessively bend the threads, as this could cause them to snap or the phosphor layer to crack, thereby affecting their illumination capacity. This may

result in small dark spots throughout the thread, up to a short circuit of the whole system.

6. Proper Insulation: To prevent accidental shocks or thread damage, always ensure that the connections are well-insulated and the thread is safely stored when not in use. Never leave any section of the exposed conductive surface as it could come in contact with other conductive materials, leading to a short circuit.

By adhering to these safety guidelines, users can comfortably enjoy the captivating lighting effects of SewGlo™ threads while ensuring they are used in the safest manner possible.

Brightness

SewGlo™ thread provides a gentle and enchanting glow that is visible even in low-light settings. This characteristic brightness is one of the unique selling points of EL thread, making it suitable for a variety of applications where subtle, yet visible illumination is desired.

The magic of EL thread lies in its ability to radiate a captivating glow that is not overly intense, overpowering, or likely to cause discomfort to the human eye. The radiance emitted possesses a unique softness, offering visibility without the harshness associated with traditional lighting sources, which can cause night blindness.

That said, it's important to note that the brightness of EL thread is not strong enough to serve as a primary light source. Its best use lies in providing accent lighting, enhancing visibility, creating captivating designs, and marking objects or individuals in low-light conditions.

Given its charm and discretion, EL thread is optimal for:

1. Night-Time Safety: EL threads can be a boon for traffic workers, construction workers, or anyone who needs to be visible in the dark. By integrating EL

threads into their safety gear, they become more visible to passing vehicles, enhancing their safety during night shifts.

2. **Dog Walking at Dusk:** Casual walks with your pet after sundown become safer with the use of EL thread. The threads can be sewn into dog leashes or collars, ensuring your beloved pet is visible to traffic and passers-by in the dim light of dusk or early dawn.
3. **Night-Time Outdoor Activities:** Whether it's a late-night bicycle ride, a morning walk or run, a camping trip, or a music festival, EL thread can provide subtle visibility without disturbing the serenity of the night. From illuminated tents to glowing bicycle gear, the applications are limitless.
4. **Evening Wear and Accessories:** EL threads can turn a simple evening gown or a handbag into a glowing masterpiece, adding an element of intrigue and sophistication to your style.
5. **Night-Time Events and Performances:** In theaters, concerts, or nighttime parades, costumes and props adorned with EL threads can create awe-inspiring visual effects against the backdrop of the darkened environment.

When employed thoughtfully, EL thread can provide a delicate balance of enhancing visibility and preserving the ambiance of low-light environments, making it a versatile and desirable lighting solution for a vast array of applications.

Emerging Business Opportunities

The burgeoning field of SewGlo™ thread technology presents a wealth of business opportunities that can be harnessed by both existing businesses and innovative start-ups. This proliferating technology can significantly enhance existing product lines, open new markets, and lead to the development of unique products and services.

Enhancing Existing Businesses

1. **Fashion and Textile Industry:** Traditional clothing and accessory manufacturers can integrate SewGlo™ thread into their product lines to create innovative, illuminated designs. This can be particularly beneficial in sportswear or outdoor gear, where the glowing threads can offer both style and safety.
2. **Event Management and Decoration:** Companies in the event management sector can leverage SewGlo™ thread technology to offer unique and eye-catching event decorations, enhancing their current offerings and creating a memorable experience for their clients.
3. **Safety Equipment Manufacturers:** Existing manufacturers of safety gear, like traffic vests, helmets, gloves, or running accessories, can incorporate SewGlo™ threads to enhance visibility features of their products, improving both the functionality and aesthetics.
4. **Automobile Industry:** Car manufacturers can enhance their car interiors or even the exteriors by integrating SewGlo™ threads into their designs, creating a futuristic look and personalized aesthetics.
5. **Advertising Agencies:** Traditional billboards and signage can be replaced or complemented with SewGlo™ thread-based designs, offering a more dynamic and engaging advertising medium.

Potential Start-up Opportunities

1. **SewGlo™ thread Design Consultation:** Start-ups can offer specialized consultation services for businesses wanting to integrate SewGlo™ thread technology into their products, guiding them on design, safety, and implementation practices.
2. **Custom EL Clothing and Accessories:** A promising sector for start-ups is the creation of custom, SewGlo™ thread-based clothing, costumes, or accessories. This could cater to a niche market of fashion-forward consumers, cosplayers, or entertainers.
3. **Art and Home Décor:** Start-ups could specialize in crafting unique art installations or home décor items using SewGlo™ threads. These products would cater to individuals and businesses looking to add a touch of modern, tech-based aesthetics to their spaces.

4. SewGlo™ thread Training Services: With the growth of SewGlo™ thread applications, there's a burgeoning need for skilled professionals who understand how to work with this technology. A start-up could offer training services, teaching interested individuals or company staff on how to safely and effectively use SewGlo™ threads.
5. Portable EL Products: Another potential start-up avenue is the creation of portable or temporary SewGlo™ thread-based products, such as pop-up event décor, portable safety signs, or camping gear, offering flexibility and portability to consumers.
6. SewGlo™ thread Kits for DIY Enthusiasts: Given the increasing popularity of DIY culture, start-ups could offer custom SewGlo™ thread kits, allowing consumers to design and create their own SewGlo™ thread-based projects.

By adopting SewGlo™ thread technology, businesses stand to create a unique position for themselves in the market, offering products and services that combine practical utility, safety features, and aesthetic appeal in unprecedented ways. With SewGlo™ threads, the only limit is the extent of the imagination.

Education

The growing application and popularity of SewGlo™ thread illuminates the importance and potential of integrating this technology into our educational institutions. By incorporating SewGlo™ thread technology in curricula, schools, particularly art and fashion institutes, it can provide a platform for students to explore, innovate and express their creativity in a never-before-seen light.

Incorporating EL thread in general education introduces students to a fascinating intersection of science, technology, and aesthetics. Simple projects can instill an understanding of basic circuit theory, material science, and design principles. This hands-on approach not only fosters a deeper understanding of STEM concepts but also sparks interest by showing the real-world application of these ideas.

Art Schools

Art schools can tremendously benefit from integrating EL thread technology into their curriculum. SewGlo™ thread allows artists to add a vibrant, dynamic element to their works, broadening the horizon of possibilities. Projects incorporating EL threads would push the artists to think beyond traditional mediums and explore the interaction of light, color, and movement in their creations.

Fashion Schools

For fashion schools, SewGlo™ thread opens up a world of opportunities for innovation and design differentiation. Students can learn how to incorporate lighting in their designs, creating fashion that is functional, aesthetically pleasing, and cutting-edge. From evening wear that shines subtly under the dance floor lights to safety gear that stands out in the dark, the design possibilities are endless.

Bringing EL thread technology to educational institutions not only prepares students for a bright future but also lights up the path leading to it. By encompassing this innovative technology, we can foster a generation of thinkers, designers, and artists who aren't afraid to shine and illuminate the world with their creations.

Conclusion

As a robust, flexible, and energy-efficient illumination solution, SewGlo™ thread is revolutionizing the lighting technology industry. With careful consideration of its unique properties and safety standards, businesses can leverage this technology to create compelling products and services, pushing the boundaries of innovation and craftsmanship.

From bespoke fashion creations to compelling visual arts and safer nighttime running gear, the future of SewGlo™ Electroluminescent thread is shining brightly. Its amalgamation of beauty, flexibility, and practicality makes it a technology worth embracing and exploring, for it has the potential to illuminate our lives in a myriad of ways.