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# Military Textiles: The Scope and Future

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**T**echnical textiles are fabrics that are made for a particular function. They are used due to their unique characteristics and technical capabilities. Military, marine, industrial, medical, and aerospace are just a few of the areas where these materials are used. For a wide range of applications, the military sector is highly reliant on technical textiles.

Severe climatic situations, abrupt body movements, and deadly atomic or chemical reactions are all protected by the fabrics, which are specifically tailored for the soldiers. Furthermore, the utility of technical textiles doesn't really end there. The usefulness of such fabrics has long been acknowledged for improving fighter efficiency and saving people's lives in battle.

Following World War II, this industry experienced significant development and growth. The progress of textile technology has led to significant improvements in military uniforms nowadays. The military uniform has evolved into an integral element of their fighting gear, also serving as a means of protection.

Smart textiles are increasingly integrating with service ecosystems that extend further than the typical horizontal textile supply chain. It is intended to expand the material and tangible qualities of technical textiles to intangible characteristics derived from services like the ability to measure and store information and adjust a material's usefulness over time.

In a Webinar conducted by Techtextil India 2021, Yogesh Gaikwad, Director of SDC International Limited said, "When we talk about military textiles, it covers a lot of spectrums such as apparel, helmets, tents, gears. The top 10 militaries have around 100 million soldiers and at least 4-6 meters of fabrics are required per soldier. Around 15-25% are repeat orders for replacing the damages or worn-out pieces. Camouflage and protection, secure locations and logistics (Rucksacks bags) are three major areas where military textiles are used."

## Major Drivers Behind Market Demand for Military Textiles:

- » Military officials all throughout the world make considerable use of technical textiles. Textile-based materials combining nanotechnology and electronics are essential in the creation of high-tech military clothing and supplies. Active and intelligent textiles, when combined with technology, have the

potential to increase a soldier's efficiency by detecting and adjusting to the pre-set condition, as well as reacting to situational needs.

- » Armed personnel will be able to complete all of their tasks with fewer equipment and less burden thanks to technological solutions. Uniforms with smart fabrics have a unique power source. It permits military to carry a single battery rather than multiple batteries, reducing the number of wires needed in their gear.

Talking about the market demand, Mr. Gaikwad further said, "One of the major purchases of ministry of defence is camouflage textiles as the survival of the soldiers depends on this fabric. The purpose of camouflage is to blend the combat suit and equipment to the natural surroundings as well as reduce the visibility of soldiers and tools.

Camouflage textiles are of two types – with IR (Infrared) specification and without IR specification. Such materials can also obscure a person's vision in UV and infrared light from a certain range. Furthermore, nanotechnology is being used to produce new technological fibres that can stimulate muscular strength, giving soldiers additional power when performing difficult tasks. The newly designed zero permeability parachute material has an incredible ability to function with high safety and efficiency."

## Physical Properties of Military Textiles:

- » The attire of military personnel must be made of light-weight fire- and UV light resistant-fabric. Designed for engineers who operate in hot environments, it should be able to control the odour.
- » It has to be biodegradable, water repellent and durable.
- » The fabric should be breathable, chemically protected
- » Military apparel should also be able to keep them warm and buoyant.

There are many more parameters to be considered while making the military textiles.

## Fibres that could provide solutions:

- » Para-Aramid



Military Camouflage

- » Modacrylic
- » Aromatic Polyamide Fibres
- » Flame Retardant Viscose
- » Nanotechnology-enabled Fibre
- » Carbon Fibre
- » High Modules Polyethylene (UH MPE)
- » Glass Fibre
- » Bi-Component Knit Construction
- » Gel Spun Polyethylene

#### **Competitive Market Analysis of Military Textiles:**

The marketplace is quite competitive. Companies compete on improved smart textile performance, cost-effective technologies, quality of products, durability, and market share. Suppliers must deliver cost-effective and high-quality goods and services to survive and prosper in this climate.

Governments across the globe have put a great priority on providing their forces with the most up-to-date equipment and facilities, especially advanced military gear. As a result, the worldwide technical textiles for defence market have grown. Smart textiles have improved the efficiency and features of military apparels by increasing aspects such as maximising camouflage, incorporating technologies into the garments, reducing the weight carried, and boosting ballistic protection utilising cutting-edge technologies.

#### **Application Segment of the Military Smart Textiles Market:**

Camouflage, power harvest, temperature monitoring & control, security & mobility, health monitoring, etc. are some of the applications that the worldwide military smart textiles market can be divided into.

By 2027, the worldwide military smart textiles market is expected to be dominated by the camouflage sector.

Energy harvesting, temperature monitoring & control, and health monitoring categories are likely to increase at a robust pace during the predicted period, creating considerable incremental possibilities. Other sectors are expected to grow at a medium to high rate in the coming years in terms of quantity.

According to a UK Publication, A “smart” skin influenced by chameleons which changes colour depending on the light might be the future of military camouflage. As per researchers, the revolutionary material may also be useful in anti-counterfeiting activities.

Chameleons and neon tetra fish, for example, can change their colours to disguise themselves, attract a partner, or scare attackers, according to the researchers.

Experts have attempted to recreate similar characteristics in synthetic “smart” skins, but the substances used have still not proven to be durable.

#### **Regional Analysis of Military Textiles:**

Asia, particularly growing countries like India and China, has seen a significant rise in the military sector. In the APAC region, defence budget is increasing at one of the fastest rates throughout the world. Combined with the need to prepare military soldiers for modern combat, large sums of money have been invested in new military equipment as well as improved military apparel.

Asia Pacific leads the worldwide market demand for military, smart textiles. Europe and the US come in second and third position, respectively. The market of military textiles in North America is expected to grow as the nation’s textile sector expands. The textile industry employs 6% of the entire manufacturing workforce in Europe. The United Kingdom spent 21 billion pounds in 2019-2020 in this sector. Thus, the market in Europe is predicted to grow as the textile industry in Europe expands.