Technical Textiles: A Bright Future

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One of the segments of this industry that has received significant attention across the world is technical textiles. Technical or engineered textiles are defined as products that are used for functional purposes. These textiles have applications in multiple areas of economic activity, such as aerospace, shipping, sports, agriculture, defense and health care. Technical textiles are consumer driven products that are gaining tremendous popularity for their multi-dimensional advantages.

Technical textiles used in the infrastructure industry, which are termed as geo-synthetics. First came into usage in the mid-1990s in India. This period coincided with India's thrust on infrastructure development which was led by the NDA Government during that time. Since then, geo-synthetics have gradually become an intrinsic part of the Indian infrastructure industry with usage in applications like Highway construction, River training, Coastal protection, slope protection and erosion control, especially in hilly terrain, Landfill and industrial linings.

As the economy improves, often the construction business does well but, Civil engineering has always readily adapted up to the minute technologies, using innovations like Geo-synthetics and many others. Geo-synthetics have become time honored construction materials for geotechnical and environmental applications in most parts of the world as they constitute contrived materials, new products and applications developed on a routine basis to provide solutions to the critical problems.

Geo-synthetics play an important role in geotechnical applications because of their versatility, cost effectiveness, ease of installation, and eco friendliness. Geo-synthetics inclusion within a soil mass can provide a reinforcement function by developing tensile forces which contribute to the stability of the Geo-synthetics-soil composite (a reinforced soil structure). Design and construction of stable slopes and retaining structures within space constrains are aspects of major economic consideration in geotechnical engineering projects. Probably because of these many attributes, the use of Geo-synthetics has often promoted innovation in multiple areas of civil engineering.

These applications straddle the gamut of needs for the construction and infrastructure development sector today. Geo-synthetics are adding value by either reducing the total cost or by prolonging the life of the structures as compared to conventional solutions. When we talk about the Indian infrastructure industry, the reliance has been on traditional materials of construction like concrete, boulders, etc. All of these materials are non-renewable i.e. for concrete, the basic ingredients are cement and aggregates which are a limited resource for India.

Geo-synthetics offer an alternative material of construction which has the following advantages:

- Economy as compared to traditional materials, (i.e.) it reduces overall cost of construction by using locally available materials like soil or sand.
- Longer life by improving the durability characteristics of traditional materials (for ex) geo-synthetics usage in roads can delay rutting or cracking and thereby prolong the serviceable life of the road
- Eco-friendliness of the solution, by use of locally available materials

Natural fibers are gradually emerging as essential ingredients of various types of textiles in view of increasing global concerns. Reduction of carbon foot print in constructions is currently attracting global attention, warranting innovations in construction technology with stress on eco-congruity.

In this context increasing use of eco-concordant materials made of natural fibers to the extent feasible in constructions is considered significant. Textile Technology is at the same time poised to take an innovative turn by manufacturing products that could meet the technical requirements on the one hand and could help maintain eco-congruity on the other.

The global geo-synthetics market is expected to generate revenues of US$12.8 billion by 2020, growing at a CAGR of over 10%.The market growth in the developing countries of Central and South America, and Asia are slated to drive the global demand in geo-synthetics, due to their focus on infrastructure development. Therefore, it is clear that the global future for geo-synthetics is linked to the emerging economies

In India, the spending in the XII Plan (2012-17) in infrastructure is estimated to be USD 01 Trillion, which is expected to grow for infrastructure activities for the XIII Plan (2017-2022). India has so far been a little slow in the utilization of geo-synthetics, mainly due to a lack of awareness as well as due to rigidity in the administrative machinery that did not allow alternative means of construction.

Over the past few years, a number of strides have been made in raising awareness of the benefits of geo-synthetics as well as formulation of codes and guidelines for Indian conditions, which will enable the users to take informed decisions on geo-synthetic usage. With these continuing initiatives, it is expected that the usage of geo-synthetic technology for India will receive a major boost in the years to come, and that geo-synthetics will become an intrinsic part of every infrastructure project undertaken.

Garware is one of the few companies in the Indian geo-synthetics domain that offers end to end solutions for almost all the sectors of application. This means that Garware operates as an EPC (Engineering, Procurement and Construction) company in the Geo-synthetics domain. Garware has undertaken projects predominantly in the following areas:

- Landfill and Lining engineering – for industrial conglomerates

- Coastal and river protection structures – for state / central governments and industrial conglomerates

- Rock fall mitigation – for roads and railways

- Retained Earth structures and slope stabilization for highways