

BUILDING THE NATION WITH TEXTILES



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India is a dream whose time has come. The development of New India and with a focus on self-reliance is the key to its growth story. The textile sector being a major contributor to the GDP of the country also stands aligned with offering its services for the growth of the nation, says **Dr. Mohit Raina.**

Most recently, the Honorable Finance Minister Ms. Nirmala Sitharaman presented the Union Budget. Infrastructure spend of about Rs. 10 lakh crore in the Budget of 2022-23 will help propel the growth of the country as infrastructure acts as a growth multiplier. With the National Infrastructure Pipeline (2020-25) envisaging an investment of Rs 111 lakh crore, the target annual investment ranges between Rs 20-22 lakh crore. National highways will be expanded by 25,000 km during 2022 and the national ropeway development programme will be taken up in the public-private-partnership (PPP) mode. In spite of these investments, corrosion and dilapidation of these structures poses a severe threat to these developments. A study carried out R. Bhaskaran,

N. Palaniswamy, and N.S. Rengaswamy published in the Corrosion Reviews 2009 evaluated the cost of corrosion in India to have escalated from 1960 to 1986 by 26-fold and the estimate was pegged at a value of Rs. 40760 million in 1986. Comparing annual cost of corrosion with GDP over the era of newly independent India from 1950-1990, corrosion contributed to about 5.95% the GDP of the country annually. With the growth in the infrastructure sector and the impetus given, we as a country need to make sure that in New India we apply advanced materials to resolve this challenge faced by our very own selves by learning from the past.

One might wonder as to what the contribution of the textile community would be to this infrastructure growth. In fact, the textile industry is the only industry, which can help build a sustainable infrastructure by means of fibres, textiles conventionally known as technical textiles. If nature were to be taken as a benchmark, textile and fibrous structures are the ones which provide nature with

its sustainability. It is time that we seriously begin to learn from nature and create sustainable structure with fibres and textiles. The commonly known names like Buildtech, GeoTech and Marinotech are synonymous to sustainability in the infrastructure domain.

Currently, extensive amounts of steel reinforced concrete are being used for building structures all across India. A major challenge faced by steel reinforced concrete is the corrosion resistance of the steel in the coastal areas of India. India has a coastline of 7,517 km. The temperature in the coastal regions often exceeds 30°C (86°F), and is coupled with high levels of humidity. Annual rainfall in this region averages between 1,000 and 3,000 mm (39 and 120 in). These extreme climatic conditions have a great effect on the reinforced structures. Hence, the reinforced structures have to be replaced and restored after every couple of years. The textile component as a reinforcement provides the necessary high tensile strength in a concrete matrix. This leads to an appropriate load carrying capacity for applications in infrastructure. The reinforcement can be realised with short fibre or with long fibre textile structures.

The initial contributors comprised of short fibre, generally polypropylene, glass fibres, which were introduced into the concrete matrix. These short fibre reinforcements provide localised reinforcement but due to their random placement they reduce

crack propagation in concrete and are not suitable as elements carrying loads. Research has been carried out to use long fibre/ filaments as structural reinforcement. Use of textiles and fibres can help the reduction of the concrete consumption by up to 80% and also reduction of steel by up to 75%. In addition to corrosion resistance the major advantages of textiles and fibres are their better performance characteristics in terms of their strength-weight ratio, durability, flexibility, insulating and absorption properties, and fire and heat resistance. Contribution in sectors such as roadways with soil reinforcement, embankment reinforcement, asphalt stability etc., railways with applications ranging from laying the track sleepers to making the railway coach and its interiors, bridges with applications like carbon fibre strengthening to glass fibre reinforcement are going to play a crucial role in building this country.

This application will however not only need production, engineering but also formulation of building and construction IS Codes and guidelines for their successful applications. Cross-sectoral collaboration; within Ministries, certifying agencies, research institutes, engineers, operator, manufacturers and onsite contractors, is needed to facilitate this paradigm shift and transformation in India.

India is a dream whose time has come and with the policies aligned towards building a sustainable country, fibres and textiles will definitely play their part. ■

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