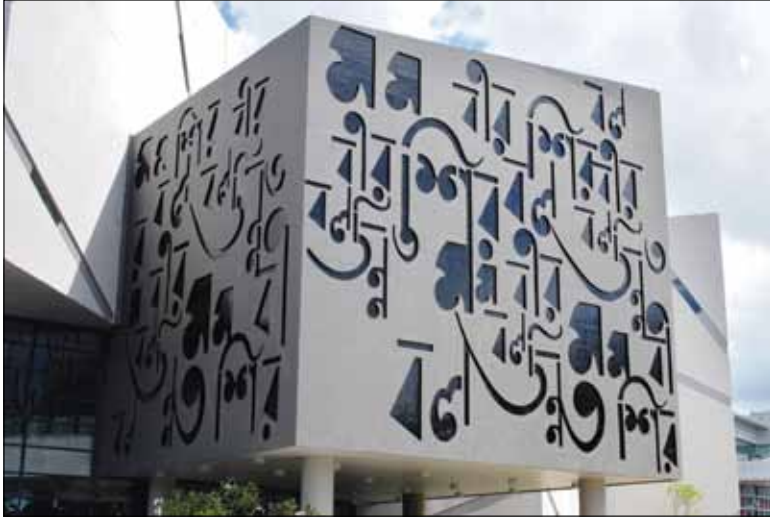


# Role of Value Added Products in the Future of Building Materials Industry



The construction industry uses mainly cement and steel which are manufactured from naturally occurring materials, however with rapid strides in urbanization, natural resources are depleting fast. Innovation and disruption have today, firmly established themselves as the defining characteristics of the highly competitive global business environment. Hence, the utilization of technology and innovation, along with advanced, research-driven design principles, to create sustainable Value Added Products, is a need of the hour, to facilitate a brighter and sustainable future for construction sector.



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Specialised products especially in the real estate and construction sector, are precisely created to address the many challenges posed by conventional alternatives, and emerge as better solutions. One of the best examples of such a product is Nuvoco's Duraguard Microfiber cement, which possesses greatly enhanced reinforcing and binding power, owing to the advanced technology it utilizes. Its microfiber technology has been proven to help protect a structure against factors like seepage, dampness, cracks, and shrinkage, which are common eventualities, when conventional products are used. By being pre-dosed and pre-homogenized with microfiber, this unique cement is able to micro reinforce the 'sand – cement' matrix, which helps minimize cracks and bring about enhanced durability, as well. As a result, not only is Microfiber cement an excellent solution for almost all forms of construction work, it also offers the added advantage of lengthening the life of a structure and severely reducing maintenance costs, as well.

On the other hand, high-performance concrete

(HPC) by Nuvoco is yet another specialised product of innovation in the construction sector, which has widespread applicability in the construction of complex buildings and infrastructure projects. In fact, the quality of HPC has improved immensely, since the 1980s, resulting in a significant increase in its usage. Today, it not only offers hugely impressive compressive strengths, above 65 MPa classified as High Strength Concrete as per Indian Standard codes, but also imbues structures with higher tensile strength, enhanced durability, and increased resistance towards wear and tear. In addition to that, HPC is also designed to facilitate efficient utilisation of resources, owing to which, columns built using it are considerably smaller in size. As a result, HPC has helped reduce the overall cost of construction greatly, despite the higher cost of HPC compared to conventional concrete. In turn, it also helps reduce the environmental impact, and makes it possible to have an increased floor space. The above advantages were exploited by GAR Corporation, Aurbindo Realty and Gowra Ventures in Hyderabad and M3M India in Delhi - NCR for their respective high rise construction. One of the best examples is the Lodha World One tower, located in Lower Parel. With a height of 442 meters, and more than 300 apartments, it is envisaged to become the tallest residential skyscraper in the world. As such, the structure will be constructed using 800,000 m<sup>3</sup> of High Performance Concrete (HPC) of M70 & M95.

For many years, architects and structural engineers have demanded the best construction materials, which have led to out-of-the-box thinking and development of complex material design tools. As a result, self compacting, leveling and placing concrete was created, which gives engineers and architects the confidence to design their dream projects with ease. A similar byproduct, self-compacting, levelling and placing concrete has helped simplify the construction process, besides reducing the time and labour required, as well. Owing to its potential for enhancing the aesthetics of structures, and the construction of both vertical and horizontal parts of innovative buildings and structures, it is rapidly being adopted in the construction sector, today.

Because of the high fluidity and consistency that it offers, it was also used for the construction of Nazrul Tirtha in Kolkata, to help make it an architectural landmark. The main gate consists of an 8.5 meter high block of concrete, which is elevated on stilts, and has the Bengali words

'Unnata mama shir' carved on it, which translates to "head held high." Because of the script, the letters have several sharp ends and curves, contrary to English, and hence, posed a unique challenge for the embossing. This is where self-levelling concrete helped provide a solution for the design and placement. Because of its high fluidity, the concrete was able to flow freely around the congested steel reinforcement, and also eliminated the need of vibration, helping prevent noise pollution during the construction process, as well.

By bringing in cutting-edge innovation in material chemistry and rheology studies to the local and small volume needs, the first ready to use wet mix concrete was created in small 35 kg bags. This unique product guarantees quality assurance and sustainable construction in the space of affordable housing, job sites in congested areas where accessibility is a big challenge and also big construction sites where low volumes of concrete are required for ease of construction. The product is also a prime example of disruptive innovation in the repair segment, which has been dominated by dry mix products. Since the concrete is premixed and packed in bags, it also helps avoid the wastage of cement, sand, aggregates, and water at the construction site, besides making it easier to be transported. This made it a perfect choice to be used for the restoration of one of the oldest landmarks in Mumbai, Elephanta Caves. The concrete was transported to the middle of the sea via boats, and since the distance to be covered was quite vast, the concrete was also customized to have a longer retention time, to prevent it from setting during transportation.

Today, the repair and retrofitting of existing structures forms a critical part of the construction industry, all over India. The mixing of dry mix micro concrete at the construction site is a major challenge plaguing several repair contractors as well as clients, because it needs significant skilled labour and minute supervision, during the mixing process. As a result, the execution of such projects is usually quite slow. Hence, a ready to pour, pre-mixed, non-shrink wet micro concrete was the perfect solution for the repair and retrofitting of structures. Owing to this massive potential for its use in several diverse construction activities, wet-ready-to-use micro concrete has found significant popularity ever since its launch, despite the repair segment in India being largely dominated by dry mix products.

Besides the above, decorative concrete is also a popular innovation, which helps builders have the freedom to push the boundaries of design, which also requires reduced maintenance, and offers enhanced durability. It also looks much better than conventional alternatives, and comes in a variety of vivid colours, patterns and textures. In fact, it's incredibly realistic texture and capacity for bringing subtle design elements to life are exactly why it was used for Sharda University in Delhi.



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Light weight concrete is also yet another popular product, which boasts of low density and thermal efficiency. Because of its short turnaround time and consistency in quality, it has become an excellent alternative to Brickbat Coba. With a density of 800-1800kg/m<sup>3</sup>, it also helps reduce the structural weight of a building, because of which, it was used as a screed over the cast iron lotus form of the Amritsar entry gate dome. The aggressive focus on infrastructural development in India, along with the country's massive population, has revived the need for vertical construction, as the most effective utilization of space. An efficient strength-to-weight ratio of the concrete used is a major factor defining the design of high-rise concrete structures such as these. Owing to the widespread use of conventional concrete in such projects, the efficiency of the structural design has almost entirely depended on concrete mixtures of high strength, while the weight of the concrete has been considered a constant. However, a significant part of the dead load that such structures have to bear is a result of conventional grade concrete, used widely and commonly in the sector. Serving as an excellent alternative to this, Nuvoco's Structural XLite Concrete (LWC) is a specialised and technologically advanced product that is increasingly gaining in popularity in the Ready-Mix-Concrete (RMC) and construction industry today. Structural XLite is comparable to regular concrete, offering high strength and a density of 1000 - 1800 Kg/m<sup>3</sup>, while being much lighter. As a result, it possesses immense potential for use in the construction of high-rise vertical structures and adding storey / floors to existing buildings. **CS**