

TECHNOLOGY MEETS OPPORTUNITY

New road projects and airport expansion projects are expected to create considerable demand for asphalt plants. With projects getting bigger, the focus is now shifting from batch to continuous plants.

Rs 1.2 trillion investment in roads and highways; extension of 3.17 lakh km of rural roads; 35,000 km highway construction under Bharatmala Pariyojana scheme- it seems that there is a lot slated to happen in the coming years in rural roads and highways. As most rural roads will be asphalt laid, there is expected to be a demand growth for asphalt plants in future. Also, the government plans to develop 100 more airports across the country in 15 years. With the runways and parking areas being constructed using asphalt, there is a considerable amount of it required, which will in

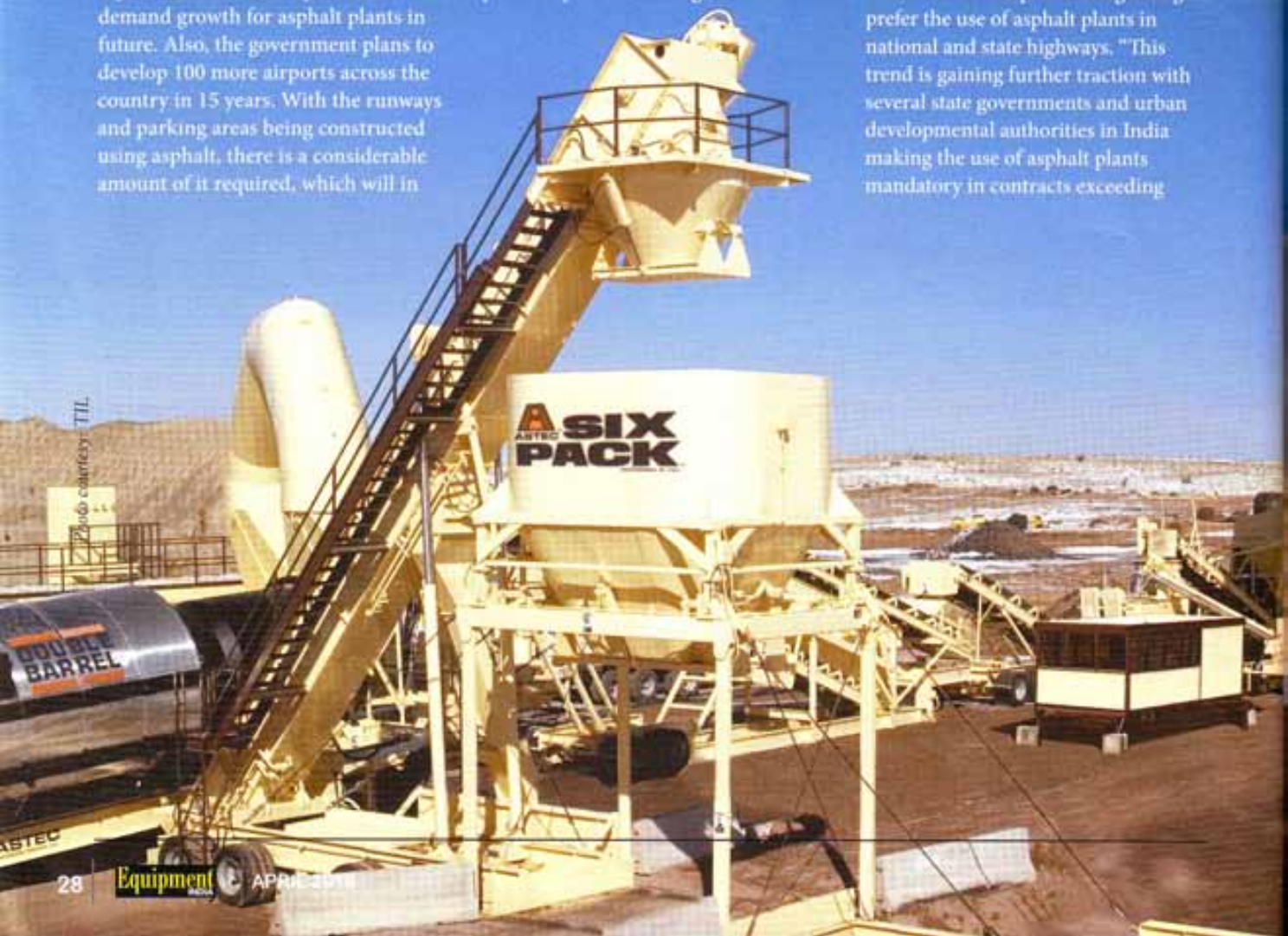
turn, accelerate the sales of asphalt plants.

Current market trends

Infrastructure sector is gaining momentum after a protracted slowdown, with stalled projects being revived and new projects being announced in roads and highways, ports, airports, etc. The government's

new policy initiatives and budgetary support have also fuelled the positive trends in the sector. Consequently, asphalt plant manufacturers are expected to witness a surge in demand for their products in the coming years.

According to Raj Shrivastav, Executive In-Charge - Crushing, Screening & HMAP, TIL, more and more road developers are beginning to prefer the use of asphalt plants in national and state highways. "This trend is gaining further traction with several state governments and urban developmental authorities in India making the use of asphalt plants mandatory in contracts exceeding





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- Raj Shrivastav,
Executive In-Charge - Crushing, Screening &
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Photo courtesy: L&T Construction



Continuous technology has evolved over the years in asphalt plants.

certain values. So there will certainly be an increase in the demand for asphalt plants, especially higher capacity plants, contingent on large-size projects that are likely to be awarded."

SP Rajan, Head - Plant & Machinery, Roads, Runways & Elevated Corridors, L&T Construction - Transportation Infrastructure IC, elaborates on the prevailing trend in the market, "The surge in concrete roads certainly brought down the demand for asphalt plants. But, if you see our fleet, all the asphalt plant units are engaged and we do need a few more. Also, the projects that come up further are a mix of asphalt and concrete. Thus, the demand is expected to remain."

He adds, "At the same time, the contractors are very selective and cautious. Most of them are moving towards a rental/lease model. This apart, the contractors expect good mobility of the plants. Thus, the plants of 120T capacity continue to be in demand."

Shift from batch to continuous

Asphalt batch plants have been more prevalent because of the apparent flexibility that they offer in terms of the required variations in the

mix and quality of each batch of output, and the regulations in India. "However, over the last couple of decades, continuous technology has evolved in asphalt plants, with many

PRODUCTIVITY AND EFFICIENCY FEATURES OF ASTEC PLANTS

- Counter flow continuous technology for optimising fuel efficiency
- Option for multi-fuel burner
- Screw conveyors for returning fines collected in the baghouse to the drum
- Capability to use up to 50 per cent RAP
- 100 per cent portable plants for quick set-up and dismantling
- Aramid fibre bag house filters to prevent dust emissions and protect the environment
- PLC-based controls for better plant operations
- Bigger surge bin for storage and discharge of mixed material with minimum segregation
- Latest generation of warm mix systems that simplifies production of warm mix asphalt, achieving better foaming with less maintenance



CONTINUOUS VS BATCH MIX PLANTS

In a batch plant, sized aggregate is placed in cold feed bins and blended to some degree depending on the particular plant, before being sent to the dryer. When the aggregate exits the dryer, the aggregate blend is carried to a large screen and separated into four or more blends. The mix gradation called for in a particular batch is created by 'pulling' an appropriate amount of aggregate from each of the bins, commonly called hot bins, since they contain hot aggregate. It is generally assumed that a batch plant can accommodate inconsistent aggregate blends in the cold feed due to the screening operation that takes place at an intermittent point in the process. This is not so. In contrast, a continuous plant blends aggregates at the cold feed system as the controls 'tell' each cold feed bin feeder exactly how much aggregate is required to satisfy the mix design requirements. The blending at this point in the process is very precise. This mixture is then dried, mixed with liquid AC (bitumen), and transferred to a surge bin or storage silo. If RAP is added, it is first fractionated into hard-to-segregate sizes and treated just like the virgin aggregate. It is placed into two or more RAP feed bins and is precisely blended before being mixed with the virgin aggregate. The virgin aggregate and RAP are mixed together before the virgin AC (bitumen) is added. Of course, a consistent mix depends on consistent aggregates in the cold feed bins, but a batch plant must also have consistent aggregates at the cold feed end of the process in order to produce a consistent product. Since consistent aggregates are required for both a continuous and batch process, the continuous plant becomes the plant of choice with respect to initial cost, operating cost, maintenance cost, portability, and RAP processing capabilities.

Other major features differentiate continuous plants from batch plants are:

Sequential mixing: In a batch plant, all ingredients are dumped into a pugmill that mixes them for a span of time varying from 20 to 60 seconds depending on the operator that can change the dwell time according to the queue of trucks. While in continuous technology, the mixing time that varies from 45 to over 200 seconds cannot be adjusted so that every particle of aggregate has time to be coated with bitumen, sequential mixing also makes it possible and very easy to add different additives and ingredients like fibres, chemicals, etc, and incorporated them into the mix properly and homogeneously.

Portability: Continuous plants are able to literally 'travel' with the road project while it is built without the need of any foundations. The plant can be folded down and reassembled in 24 to 72 hours depending on the technology and the size. This compares to 6 to 12 weeks for a batch plant.



ASPHALT BATCH-MIX PLANT GUARANTEES THE HIGHEST LEVEL OF FLEXIBILITY IN PRODUCTION AND QUALITY OF THE FINISHED PRODUCT.

- Ajay Tripathi,
Technical Director, Nilang Asphalt Equipments

countries adopting this technology in view of the inherent benefits with respect to initial and operating costs, and portability," says Shrivastav.

He adds, "World over, especially in North America, there had been a clear shift from batch plants to continuous plants during the phase of mega scale infrastructure projects. This is what we are experiencing now in India where there's a need for a technology that is able to produce steady quality of mix, at very high productivity, therefore low cost, while being amenable to high recycling and portability."

Ajay Tripathi, Technical Director, Nilang Asphalt Equipments, explains, "Asphalt batch-mix plant is the widespread type of asphalt plant in the world, which guarantees the highest level of flexibility in production and quality of the finished product. However, continuous asphalt drum mix/hot mix plant provides uninterrupted production cycle as the rhythm of production is not broken into batches.

The mixing of the material takes place inside the dryer drum, which is elongated, as it dries and mixes the material at the same time."

Product mix: Batch and continuous plants

Batch-mix and continuous drum mix are the two major types in the hot-mix asphalt plants. In India, the trend is slowly changing from batch-mix plant to continuous plant. TIL, under strategic alliance with Astec Inc, USA, offers a range of hot mix asphalt plants in India. Shrivastav elaborates on the range, "Astec's superior understanding of the requirements in this segment enables us to provide our customers with some world-class asphalt plants. Apart from being energy efficient, they can utilise up to 50 per cent recycled asphalt pavement (RAP). Faster set-up, by virtue of their modular design, ensures higher uptime and availability of the plants. These plants can be towed away and installed at ease."



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Head - Plant & Machinery, Roads, Runways & Elevated Corridors, L&T Construction - Transportation Infrastructure IC

He adds, "The Astec-TIL range of asphalt plants are equipped with a host of important features that improve efficiency, enhance productivity, help in conserving the environment and also provide significant advantage on total cost of ownership.

It is our constant endeavour to incorporate in our products the latest cutting-edge technology, in order to offer long-term solutions and add value to customers' operations."

TIL offers state-of-the-art six-pack double barrel asphalt plant, available in three variants - 200 tph, 300 tph and 400 tph - which brings with it phenomenal savings, in terms of



Photo courtesy: L&T Construction

The demand for asphalt plants is expected to remain.

transportation, dismantling and installation costs, and enhances customer profitability manifold, according to Shrivastav. The standard set-up comes with the double barrel drum mixer, cold feed, scalping screen with inclined conveyor, baghouse, surge bin, drag conveyor and control house. The baghouse load also holds the inertial dust collector. One load handles the SEB and drag conveyor. All ship complete with duct-work, dust

screws, electrical switchgear, cables, and plant controls. The company also supplies RAP bins, fuel tanks, lime mixers and AC tanks.

Shrivastav also elaborates on other products, "We have the 120 tph Astec Voyager HMAP with unified drums, which enable heating and mixing in the same drum. The Astec Voyager 120 - a highly compact and portable plant in this range - is unique in its class for its ability to run up to 30 per cent RAP.



Photo courtesy: Nilang Asphalt



The plants of 120T continue to be in demand.

The Astec Voyager 120 is built around a counter-flow drum featuring Astec v-flights, which provide greater uniformity of the aggregate veil during the drying process, resulting in better heat transfer, reduced fuel usage and increased productivity. To enhance portability, a hydraulically driven swing out drag and batcher can be set and ready to go in about 10 minutes. Other features include a reverse pulse baghouse, a controls cab with fully automated PLC controls, gravity take-up with direct drive, air ride suspension and up to five cold feed bins and two RAP bins.

TIL also offers the 72 or 117 tph Nomad portable hot mix asphalt facility. Intended for portability, durability, and reliability, Nomad plants meet the demands of a variety of small, medium and large projects that require a quality hot-mix asphalt, according to the company. Nomad plants are offered in various configurations, from the standard plant, with two split bins and a wet scrubber, to the expanded plant with baghouse and a silo.

As one of the leading contractors in the country, L&T Construction has a fleet of about 25 hot mix plants of brands such as Marini and Lintec in capacities

ranging 20 TPH, 200 TPH and 240 TPH. On choosing the right plant, Rajan says, "Accuracy, filler handling, fuel consumption, ease of erection and commissioning and spares support are the major factors we consider when choosing an asphalt plant."

Minimising emission

Atmospheric emissions in asphalt plants occur mainly during the drying and mixing phases; loading and discharge of materials; and other phases of the overall site operations. Shrivastav describes, "The Astec-TIL range of asphalt plants produce warm mix asphalt, the benefits of which are well known in the asphalt paving industry, viz reduced energy consumption, lowered emissions and elimination of visible smoke. Features like highly efficient burners and baghouse filters in counter-flow systems, and large sized knockout boxes and cyclones in parallel flow systems, contribute towards effective pollution control."

Astec is one of the very few brands that are allowed in places like California and Northern European countries, which have very stringent environmental regulation, and even near or within highly populated areas.

Asphalt mix pattern

A rising trend is the use of RAP in the asphalt mix to enable sustainable road construction, which is being encouraged by MoRTH, IRC, CRRRI, NHAI and other agencies to reduce the carbon footprint of road construction. "Use of RAP has been made mandatory by NHAI and the Astec-TIL asphalt plant with double barrel technology is capable of using up to 50 per cent RAP," says Shrivastav. He adds, "The next 'Big Thing' in India will certainly be the warm mix (WAM) produced with water foaming. It consumes at least 14 per cent less energy, has better compaction and much longer resistance to fatigue (up to 13 times more) according to independent long term lab studies in the US and Europe."

Emerging opportunities

India needs to address the huge infrastructure deficit that has existed since independence. According to Shrivastav, apart from more national highways under the Bharatmala program, the demand for all-weather roads for better port-hinterland connectivity, as well for linking them with major highways, border roads, coastal roads, etc, will drive the demand for asphalt plants. And then we also have some big ticket projects in new airport construction and modernisation of some others, which will involve a substantial outlay of asphalt roads. Consequently, we expect the demand for our products to increase significantly. Earlier, policy makers favoured concrete roads because the longevity of concrete roads was considered to be high. But now we are realising that asphalt roads are equally good. In the US, they are used because asphalt can be recycled better than concrete. Greater energy efficiency and automation, environment-friendliness and lower cost of operations, as offered by our asphalt plants, are expected to find very good acceptance in the market going forward.



- SUDHEER VATHIYATH