

Tight asphalt market

High asphalt cement prices sour the 2000 mix for plant makers

by Allen Zeyher

The year 2000 might have left a bad taste in the mouths of asphalt plant makers. After starting out with high expectations prompted by increased highway funding from the Transportation Equity Act for the 21st Century, what really soared was the cost of petroleum, which pushed up the prices of asphalt cement and the fuel needed to transport aggregate and other materials.

The price of asphalt cement went up from about \$115/ton to about \$200/ton, according to Jon Patti, a spokesman for Asphalt Drum Mixers Inc. (ADM), Hometown, Ind., who called the increase a “devastating blow.”

Another source told **ROADS & BRIDGES** that the price of diesel fuel for the asphalt plant burners had risen from \$0.75/gal to \$1.87/gal.

“The funding is there,” Patti told **ROADS & BRIDGES**, but some states have been slow to release contracts for highway work, and adding to their reluctance is the high cost of fuel. Patti said the increased cost of asphalt cement has added about 20-25% to the cost of the finished asphalt.

The increased cost of asphalt has depressed demand for the plants manufactured by companies like ADM. The primary effect of the slowdown on ADM has been a smaller backlog. “Usually, at the height of our season, we’ll be out anywhere from 10 to even as high as 16 weeks backlog,” said Patti. “This year we only enjoyed anywhere from about three weeks to about eight to nine weeks backlog throughout the year.”

Another effect of the tight market—and the resulting overabundance of asphalt production capacity—is that ADM has been reluctant to invest in developing new products. “Until there is a substantial response from our market, I don’t think you’re going to see ADM introducing anything new.”

The Superpave asphalt mix is gaining wide acceptance, said Patti, with many states now specifying Superpave for highway work. But contractors can

produce Superpave with their existing plants, so the new mix has not created a new market for ADM’s products.

Patti thinks it will be a while before people get over the “sticker shock” of significantly higher asphalt prices and the marketplace gets back to normal. “How long will that be? I think it’s anybody’s guess.”

Until then, we have ADM’s Roadbuilder series of portable and stationary parallel-flow asphalt plants. Four models are available, with drum

ft/min to 55,000 cu ft/min. Two sizes of cold-feed bins are available for aggregate storage and drum loading.

Roadbuilder’s parallel-flow design maximizes drying by moving moist aggregate away from the burner flame in a veiled, rotating pattern that directs more of the heat to the aggregate. A fuel-efficient, gap-fired burner produces the dryer flame. The flame is shaped to minimize asphalt cement burnoff, resulting in cleaner emissions than other parallel-flow drum plant designs.



An Astec Six Pack asphalt plant is completely portable, with built-in running gear, and is fully self-erecting. It can be taken down, moved and set up again in 36 hours. Pictured is a truck waiting to receive HMA from the hopper and a silver Double Barrel drum mixer.

diameters from 62 in. to 96 in. and production capacities from 110 tons per hour (tph) to 350 tph of hot-mix asphalt (HMA).

Roadbuilder plants also are available with ADM’s portable Self-Erect Silos, with capacities from 30 tons to 75 tons, or with three stationary-style silo models, with capacities of 100, 150 and 200 tons.

Baghouses for Roadbuilder plants are available for either portable or stationary use, in capacities from 21,000 cu

With a self-contained design and rugged construction, the complete plant can be moved in five to eight loads, depending on size. Portable and stationary units are prewired with quick-connect electrical terminals that are pretested at the factory. Roadbuilder plants are designed to produce a variety of mixes and to operate on a choice of fuels, including heavy oil and any pre-specified electricity. The plants can be assembled onsite without a crane.

Firing both barrels

The Double Barrel mixer from Astec Industries Inc., Chattanooga, Tenn., has an inner dryer drum that rotates and an outer shell that remains stationary. Aggregate is dried in the inner drum, then mixed with liquid asphalt in the bottom of the outer shell, stirred with mixing paddles attached to the outside of the dryer drum.

Because mixing takes place away from the hot gas of the dryer, the liquid asphalt does not get oxidized into blue smoke, and the unit produces no visible emissions, even when using up to 50% reclaimed asphalt pavement (RAP).

The Double Barrel comes in portable (200-400 tph), relocatable (200-500 tph) and stationary (200-600 tph) versions.

From the Heatec division of Astec comes a line of heaters and storage tanks for HMA plants. For example, Heatec vertical tanks that provide mixing, heating and storage for polymer-modified asphalt cement are available in capacities from 10,000 to 35,000 gal. The tanks maintain temperatures higher than normal to achieve proper blending, and a mixer keeps the mixture in uniform suspension.

Horizontal asphalt cement tanks are available in capacities from 5,000 to 40,000 gal. The tanks have serpentine heating coils with hot oil flowing through them.

The CEI Enterprises division of Astec offers a compact mobile asphalt plant called the Nomad that it says meets the needs of contractors who do a lot of small projects such as driveways and parking lots, but also is well suited for secondary roads, especially in rural areas.

The Nomad HMA plant produces up to 130 tph of asphalt and comes in four units: a mixer, a drag conveyor and hopper, a tank and a control house. The mixer unit includes a combination dryer and mixer, aggregate bins, an aggregate feed system, a burner, a drum, an exhaust fan and a dust collection system—all on a single trailer frame.

A detachable stand supports the hopper and drag conveyor in the upright position. The drag conveyor receives the hot mix from the discharge chute of the drum unit and conveys it to the hopper, which also functions as a surge bin. An air cylinder opens the gate at the bottom of the hopper to dump the hot mix.

The tank has a capacity of 15,000 gal and has a burner to maintain the asphalt cement at a liquid temperature, as well as an unloading pump and

metered pump that controls flow to the drum mixer. The entire operation is monitored and controlled from the mobile control house, which is heated and air-conditioned and has a console that incorporates motor controls for all the plant motors and a programmable logic controller to control blending of the mix.

Marching to a triple drummer

The Triple-Drum counter flow asphalt production plant from CMI Corp., Oklahoma City, Okla., combines three

distinct drying and heating zones in a single drum, resulting in higher production capacities for virgin and high-ratio RAP mixes. The variable-length combustion zone permits easy switching from one mix or production rate to another. Any visible hydrocarbon compounds that develop are drafted to the highest temperature zone of the drum and incinerated.

The heart of the Triple-Drum, according to the company, is a technologically advanced mid-drum, variable-length, high-temperature, radiating combustion

zone. This feature includes overlapping heat reflector/transfer elements and provides five major advantages to hot-mix production and recycling: (1) enhances total fuel combustion; (2) prevents RAP and virgin aggregates from interfering with the combustion process; (3) provides conductive, convective and radiant heat to RAP and virgin aggregate in the combustion, blending and mixing zones of the drum; (4) prevents high shell losses in the combustion zone of the drum as compared with conventional counterflow drum mixers; (5) provides

highly efficient incineration/oxidation of gaseous emissions from the mixing and blending section of the drum.

CMI offers portable Triple-Drum models with production capacities up to 750 tph.

CMI also offers the Impulse II control system, which "precisely and continuously controls all plant operations from startup to shutdown," according to the company. The system uses programmable logic controllers and a personal computer to continually adjust the motors that control the flow of

aggregates and asphalt cement for each asphalt mixture.

Impulse II tracks mix temperature, stack temperature and a full range of other plant operating variables. The system also features alarm monitoring, real-time diagnostics and detailed procedures for calibration.

Ultra emphasis on efficiency

Restrictive permitting and volatile fuel prices have prompted Gencor Industries Inc., Orlando, Fla., to focus its efforts on reducing emissions and increasing efficiency. Gencor's Ultraplants have capacities from 100 tph to 800 tph and can switch from continuous to batch operation with the flick of a switch.

The company has developed an Advanced RAP Entry (A.R.E.) system that allows much higher production of recycled materials with extremely high moisture. "The A.R.E. concept increases conductive and convective heat exchange," according to Gencor, "thereby reducing energy demand while increasing production."

The heart of Gencor's Ultraplants is the company's counterflow drum. The drum maximizes heat exchange by moving the aggregate toward the burner flame where the highest temperatures are. As a result, according to the company, energy is transferred to the aggregate and not lost up the stack, and the temperatures of the exhaust gases leaving the dryer are much lower than in conventional drum mixers. Adjustable flighting also allows precise veiling adjustment to accommodate varying aggregates for maximum heat transfer.

Gencor's Ultradrum incorporates an isolated mixing section located behind the burner so there is no chance of liquid asphalt coming in contact with the burner flame. The result is that there is no oxidation of the asphalt, and no asphalt vapors enter the exhaust gas stream.

Other vapors generated in the mixing section are pulled through the burner and consumed as fuel.

The company's Ultra II burner uses compressed air to atomize each droplet of fuel for complete combustion and maximum fuel efficiency.

Other features include a self-cleaning RAP inlet that allows up to 50% RAP without clogging.

Tireless mixing

The Tireless Rotary Mixer from Aesco/Madsen, Auburn, Wash., employs two massive, mounted bearings instead of steel tires and trunnions.



CMI's Triple-Drum combines three distinct drying and heating zones in a single drum.

This design eliminates wear and the maintenance headaches commonly associated with traditional configurations, according to the company, and it also sharply reduces friction and drive size requirements.

The mixer can increase the user's RAP use with no blue smoke problems. Each mixer comes fully insulated, equipped with an exhaust fan mounted on the discharge shroud, a wrap-around sprocket drive, adjustable asphalt cement injection piping with rotary joint and inlet provisions for virgin aggregate, RAP and dust return. ^{RB}