In New York State, DiFiore Markets Foamed Mix As Green ‘FoamMaster’

In western New York State, contractor DiFiore Group of Rochester is gaining fame and market share in the growing environmentally sustainable paving sector by selling foamed asphalt Green Mix from the KMA 200 – predecessor of the new KMA 220 – under the brand name FoamMaster. In August, while his forces made and placed Green Mix using all three Wirtgen Group product lines of Wirtgen, Hamm and Vögele America at a high school paved area/parking lot reconstruction, Wirtgen Technology conducted this interview with DiFiore Group’s president, Peter DiFiore.

Wirtgen Technology: What is so special about FoamMaster®?

DiFiore: FoamMaster is at the top of the recycling ‘food chain’. This is a plant-produced, quality product which follows all the geotechnical standards regarding mix design, gradations, quality control and quality assurance, that are done for a conventional plant. Except it’s done in a recycling environment.

Why is that important?

That means it’s a product that can be marketed as a premium green product. The carbon dioxide footprint reduction for this material is huge, compared to conventional pavements. Not just because we don’t need as much asphalt cement, nor any carbon product to heat it, but we’re making this material right on-site, which greatly reduces hauling.

Typically we will use two trucks to place at least 1,000 tons per day of FoamMaster. Only a couple of trucks are used.

That’s another environmental point. Due to our not having to quarry stone, crush it or transport it, our FoamMaster has a greatly reduced carbon footprint compared to conventional milling, recycling and paving.

You have some buffer space here at the high school, yet you are in a residential area. But they still allowed you to set up the Wirtgen plant. Why?

Despite the fact that we are recycling reclaimed asphalt pavement (RAP), there are no fumes or blue smoke being emitted. I’ve had environmental people do testing to prove what’s obvious. You don’t see any smoke or dust. Even the cement additive feeder for the foamed mix is totally contained. Nothing is emitted to the air. We’ve tested for everything: volatile hydrocarbons, particulate matter, all the rest of it. And we’ve found nothing.
Did you use the environmentally sustainable aspect of FoamMaster as a point of interest for the school district?

Yes, they are concerned about environmentally sustainable development and were very receptive to that aspect of FoamMaster. Our pitch is that you could justify the use of this material based on the environmental considerations alone; the cost savings are just an added benefit.

What are the cost savings of FoamMaster over conventional reconstruction?

Ultimately, it's all about the money. The cost savings of FoamMaster are huge, especially in 2008 when asphalt cement prices have gone up so high. We're well below conventional hot mix asphalt, plus the additional savings in trucking and transport costs of getting the old materials out, dumped, and new materials back in.

Asphalt is the most-recycled material in the United States. By the use of RAP on this project, the savings were enormous, saving the school district a large amount of money. During this period oil prices were over $600/ton, making the oil value of the RAP approximately $30/ton.

With your KMA 200, or its successor, the KMA 220, how does the control of the mix compare to conventional hot mix plants?

With a plant like the Wirtgen KMA 200 we're on a par with all the quality control/quality assurance standards that are applied to hot mix asphalt.

Take a look at the material. It's as uniform as any hot mix material I've ever seen. We do in-place densities, we meet the regular Marshall standards of 75 blows each side. Because the material is recycled, there are some issues as to how it should be measured. But the material we placed yesterday is 100 percent of Marshall 75-blow density.

We pay attention to gradations and gradation curves, fines, and also use the same kind of testing for moisture susceptibility and stripping. We do stabilities, resilient modulus testing, indirect tensile stiffness modulus, and rut resistance. Because we are exposing ourselves in producing a lot of this material, we want to be absolutely sure that we are producing what we say we produce.

In the United States people are resigned to having to pay more for a 'green' product. But you are offering them a 100 percent green product that costs less.

Yes. But between hot mix asphalt and FoamMaster you can't make a one-to-one comparison. There are differences between hot mix and Green Mix from the KMA plant. This material can never be a surface material. We don't want it to be. Instead, we want it to be a paving base that is less temperature-susceptible to rutting and shoving. In the cold temperatures, it is more resistant to frost, a more forgiving kind of material, which is why you see it in Alaska and Canada and the U.K.

Is it tough to sell a recycled, less expensive material as a premium product?

It is different. In the United States we are reluctant to accept recycled materials because we think recycled means inferior, which it does not. Recycling is of no value unless you look at the whole life cycle. If I produce a cheaper product which appears to be environmentally friendly to begin with, but doesn't have the same life cycle, I might have to redo that work two or three times, which makes no sense environmentally nor cost-wise.

To get to this point has been a real challenge. In parts of Europe, this material would be freely accepted as a heavy-duty pavement base on major highways. Major construction using foamed base has taken place over there – including major highway work – over the last 15 years.

Here in the United States, we retain a mindset. We talk about environmental, but we really want new and shiny. We hope that our FoamMaster will be new and shiny enough for our market. By the way, FoamMaster is a registered trademark.

Few customers understand exactly what "foamed asphalt" is. Why did you use "foam" in your product name?

I like the word "foam" because it gives rise to explaining what the difference is with our product. You can take aggregates and heat them, dry them, and coat them with a heavy layer of asphalt and stick them together that way. That's an excellent...
way to do it and the only way for a surface course.

But when it comes to a paving base, you don't need such a rigid material. You don't need to make it that way; instead you can take the same asphalt cement and foam it, expand it, disperse it, and provide a proper matrix to create a dense mixture.

But the same caveats apply. You have to pay attention to gradations, sizing, aggregate fractions, all of it. We are not satisfied using an unprocessed RAP mixture. Instead we take it and sort it into aggregate fractions, much like a blacktop plant. We then further amend them by preblending certain components, and run them through the plant with all the same calibrations and quality control of a hot mix plant. And we wind up producing a material that is as quality-controlled as hot mix asphalt.

This high school campus has multiple parking lots and drives. How will you finish the pavement?

The foamed base will get a conventional hot mix asphalt overlay. We will have put in about 6,000 tons of foam-recycled paving base for the whole project.

Our KMA performed very well in producing this mix. There is no question that it is a state-of-the-art piece of equipment. In the absence of its degree of sophistication and reliability you cannot make a material like this. There are other manufacturers who make plants from which they mass-produce a type of foamed material, but they do not meet reli-

ability standards, nor provide the ability to go into a plant, calibrate it, monitor it and perform quality control. Instead we are in the cab with the computer display, constantly reconciling inputs and outputs, and come up well within ranges of a hot mix plant.

We have a database of over 100 mixes and mix designs that we have spent a lot of time isolating a number of different components, such as mineral aggregates, effect of gradations, presence of lime vs. cement, and so on. We pretty much have the ability to take representative samples and sort them out into fractions. It's a lot of work, and a lot more
work than foaming asphalt in-place. But it helps us affirm the reliability and methodology of the plant.

The KMA series from Wirtgen is the state-of-the-art of asphalt recycling. Nonetheless we don’t know all that we need to know, and we need to get more exposure for FoamMaster. We need to work with more public works and engineering people who have an interest in it. I want to do all we can to make FoamMaster more than what it is now.

After doing hot mix asphalt for 45 years, I can say this is the most exciting thing that’s come along in a long time.

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**What is ‘Green Mix’?**

Wirtgen’s Green Mix technology incorporates liquid “foamed” asphalt, in which hot penetration-grade asphalt is foamed with water and air, and is injected into reclaimed materials and aggregate in a mixing chamber.

Precise addition of water allows control of the rate and amount of asphalt foam expansion. The expanded asphalt has a resulting high surface area available for bonding throughout the materials, leading to a stable cold mix that can be overlaid with a thin wearing course. This Green Mix is placed, graded and compacted, and can permit traffic—including heavy trucks—almost immediately.

Tremendous savings in extraction and hauling costs are realized because the reclaimed asphalt pavement (RAP) used in this technology contains aggregates that have already been acquired, permitted, shot, loaded, crushed, screened, stockpiled, reloaded and hauled.

Wirtgen Green Mix technology also is produced in-situ using mobile reclaimers like Wirtgen’s big WR 2500 S. These mobile machines grind up weathered, deteriorated asphalt pavement and base in-place, and incorporate foamed liquid asphalt into the mix inside the drum chamber “on the fly”.

The ecological benefits of Green Mix from Wirtgen mobile equipment are such that it’s become a preferred means of rebuilding roads in ecologically sensitive areas such as Zion National Park, Utah, Canyon de Chelly National Monument, Arizona, I-80 through California’s High Sierras, and in 2007, Colorado’s Mesa Verde National Monument.