

Why experts are talking about foamed asphalt 40 years after its debut

EVIDENCE of a renewed interest in foamed asphalt was seen at a fall 2000 workshop in Ames where a demonstration of the technology was attended by more than 100 paving professionals from Iowa and other states.



A close-up view of foamed asphalt application.

Foamed asphalt, a technology developed in 1957, is used in the rehabilitation of pavements. The technology is receiving attention now, 40 years after it was originally developed, largely because new paving equipment has been designed for its application.

Before the reintroduction of foamed asphalt, the primary technology used for pavement rehabilitation was emulsion. Mike Heitzman, bituminous materials engineer, Iowa Department of Transportation (Iowa DOT), Ames, explains that asphalt alone is difficult to distribute thinly across a mixture unless it's heated. Either emulsion or foamed asphalt must be used to help the mixing process.

Possible benefits and challenges

Heitzman says that one potential benefit of foamed asphalt is that less curing time may be required with a pavement rehabilitation application known as cold-in-place recycling because a foamed asphalt mixture requires less water than an emulsion mixture does. The potential of opening roads sooner

is one major benefit the Iowa DOT is looking for in new technologies, Heitzman says.

According to Heitzman, county transportation agencies could see some advantages to using foamed asphalt. "They have a lot of rural pavement that can be appropriately rehabilitated with either cold-in-place recycling or full-depth reclamation," says Heitzman. "They could probably gain quite a bit by using foamed asphalt for cold-in-place recycling if there are curing advantages; a road wouldn't have to be closed as long."

When planning a cold-in-place project, Heitzman says that counties might want to consider the time factor before deciding which technology to use. If getting traffic back on the route is critical, foamed asphalt could be the best choice. If the road can stay closed for a week, cost probably controls the choice of which technology—emulsion or foamed asphalt—to use.

According to Heitzman, foamed asphalt should be a little cheaper than emulsion, but actual figures on cost effectiveness won't be available for some time. "Foamed asphalt technology expands the asphalt so that it covers more material than before," says Heitzman. "Asphalt that has increased in volume 20 times blends better with soils and aggregates."

The jury's still out

As for full-depth reclamation projects, Heitzman says it's uncertain at this point whether there will be an advantage in using one technology over the other. He says that the Iowa DOT will want to further investigate foamed asphalt for use in the state before making recommendations.

Heitzman says the Iowa DOT plans to watch the performance of the two foamed asphalt rehabilitation projects they currently have down in the state. One of them is the workshop demonstration area just north of Ames that used a full-depth reclamation application. The other project area, U.S. Highway 61 in eastern Iowa, was completed in 1999, using cold-in-place recycling. Heitzman says there was an improvement in curing time, but it's too early to tell how the surface is holding up.

Although there is quite a bit of difference in the way foamed asphalt and emulsion interact with the materials they're applied to, Heitzman says that testing has not yet been done to analyze those

The foamed asphalt demonstration north of Ames allowed paving professionals from Iowa and other states to observe the new technology. Photos courtesy of the Iowa Department of Transportation.



Iowa traffic and safety info online

differences. Heitzman says his philosophy is: “You try something and see if it works, and later you can go back and see why it worked.”

One disadvantage he cited in using foamed asphalt is that it is essential to have hot asphalt cement supplied to the project because temperature is critical to the foaming. Also, he says that the availability of foamed asphalt equipment is still in question, but there’s not much equipment in the state for emulsion, either.

For more information about using foamed asphalt, contact Mike Heitzman, 515-239-1003. •

TWO PROJECTS related to traffic and safety in Iowa have recently been completed. The valuable information and products resulting from the projects are available from the Center for Transportation Research and Education (CTRE) web site.

The Traffic and Safety Informational Series contains answers to questions that are commonly asked by the public and city council members regarding traffic and safety. The goal of the project was to develop and provide clear and consistent material that can be modified by local transportation officials to fit the needs of their jurisdiction and then distributed to the public as appropriate. The series was funded by the Iowa Traffic Safety Fund and is available at www.ctre.iastate.edu/pubs/tsinfo/.

A recent study of red light running in Iowa examined the scope and impact of the problem and evaluated countermeasures, including automated enforcement. The project was sponsored by the Iowa Department of Transportation (Iowa DOT) Office of Traffic and Safety. The findings are available at www.ctre.iastate.edu/database/00000196.html.

Both projects were a joint effort of the Iowa DOT and CTRE. •

What is foamed asphalt?

FOAMED asphalt technology is a process that expands the surface area of the material to make it go farther. In the process, a small amount of water is added to hot asphalt cement to create a foaming action that makes asphalt mixable.

Heitzman explained the process by comparing the asphalt to egg whites. Raw egg whites don’t mix very well with dry ingredients, but when the egg whites are beaten, they have greater volume and mix more easily with other ingredients. Asphalt works in much the same way.

Foamed asphalt technology didn’t gain much acceptance after it was developed in the 1950s, mainly because there was no equipment available that could efficiently and economically apply the technology. In recent years, new equipment has been manufactured that makes foamed asphalt application easier and more practical to use. •

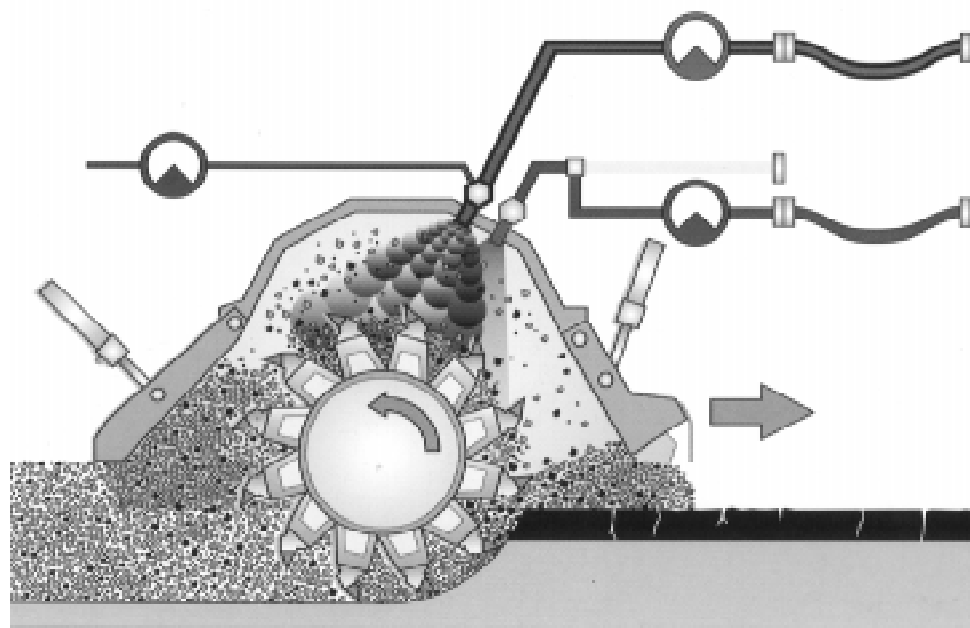


Illustration courtesy of Wirtgen GmbH.