

New Porous Pavement Comes From Recycled Glass

Hard surface gives concrete-like ride; porosity minimizes stormwater runoff; use can earn LEED points

Story by Mike Larson, editor.
Photos courtesy of Presto Geosystems.

A new kind of hard-surfaced porous pavement made from recycled glass is beginning to make its mark around the country, from the Northeast to Florida, Colorado, and now Wisconsin.

The new environmentally friendly pavement, called FilterPave™, combines a durable and decorative surface with porosity that minimizes runoff by quickly percolating stormwater into the ground or an underground storage system.

Recycled Glass Key Component

Although various kinds of porous pavements have been around for more than 25 years, the FilterPave system is the first to use recycled glass as one of its components.

Presto Geosystems, Appleton, WI, and Kaul Corporation, Lakewood, CO, designed the patented FilterPave pavement for driveways, parking lots, walkways, golf-cart paths, landscaped areas, or anywhere else that needs to combine a smooth, hard surface with environmentally friendly stormwater control.

Presto Geosystems Director Bill Handlos, P.E., says that Presto chose recycled glass as a main component because glass meets the application's physical requirements and is plentiful everywhere at low cost.

"A bottle manufacturer usually wants recycled glass in just one trademark color," he says, "so recycled glass of mixed color often ends up in landfills. We know how to turn that unwanted glass into aggregate for FilterPave porous pavements."



Handlos says the recycled glass undergoes a special process to round its edges and reduce the particles into specifically sized and shaped "glass aggregate" that is harder than stone aggregate but no more brittle when bound.

The recycled glass is supplied through certified glass suppliers.

Structure Combines Strength With Porosity

The FilterPave system's other key ingredients are an open-grade clear-stone base course, small various-colored granite and the tough but flexible elastomeric glue that binds the glass-and-granite surface layer together, yet leaves it porous.

Although the binder is strong, it is safe for use around plants and animals.

The elastomeric binder, granite chips and glass aggregate set up strong and hard, with a top surface that's smooth, like finished concrete, and an inner structure that is about 38 percent porous.

The depths of the base course and the top layer are matched to each application's water-handling needs and strength requirements.

Handlos explains, "Usually, a top layer and base deep enough to hold and pass the required amount of water will also provide more than enough pavement strength. But if needed, one or both layers can be deepened to make the pavement even stronger."

Design Minimizes Or Eliminates Runoff

The main reason for choosing a porous pavement is to handle stormwater in minimum space without building an extensive storm sewer or large detention pond.

The porosity of the FilterPave system lets water percolate quickly down through the top layer and base course into the soil or a stormwater-retention system below.

That quick percolation minimizes or eliminates runoff and erosion.

Handlos says that a properly designed FilterPave system takes advantage of nature, and can often return water to the water table by natural infiltration through the soil, minimizing or eliminating runoff.

Screeding and finishing the FilterPave pavement is similar to finishing concrete, according to Vinton Construction, except that the working time is about 15 minutes.



Workers from Vinton Construction Company, Manitowoc, WI, level open-grade base course and install the top layer for a FilterPave path at the International Crane Foundation in Baraboo, WI



A completed section of path shows the color and smoothness of the finish. Water percolates through the pavement into the ground, where it is returned to the water table naturally.

The system also permits stormwater to be collected in an underground storage system for later use in landscaping or facility operation.

Installation Method Similar To Concrete Paving

Installation is similar to paving with hand-placed concrete.

First, the ground is graded and compacted. Then forms are set. After that, the open-graded base course of clear stone is placed, compacted and leveled.

The FilterPave glass, granite and bonding agent are mixed and placed, then finished with screeds and trowels. Within a few hours, the surface hardens to useable strength.

Opportunity For LEED Credits

According to Handlos, FilterPave has the potential to rack up valuable credits under the U.S. Green Building System's Leadership in Energy and Environmental Design (LEED) program – particularly in the categories of reduced site disturbance, stormwater management, reduced heat-island effect, recycled material content, and regionally sourced materials.

Says Handlos, “In trying to qualify for higher LEED certifications, projects need every point they can collect. The FilterPave system has the potential to help earn lots of LEED points.”

“Although the FilterPave system is not the answer to every paving need,” says Handlos,

The volumetric mixer is the only piece of equipment different from those used for concrete. Located on site, it mixes the FilterPave system's glass, granite and glue by volume instead of weight. The processed recycled glass is fed into one of the mixer's hoppers from a 2,500-pound Supersak™ tote.

“when a project could benefit from an environmentally friendly, hard-surfaced porous pavement, FilterPave offers one more excellent alternative to consider.”

Installation At International Crane Foundation

One very environmentally focused location now installing FilterPave is the International Crane Foundation's (ICF) 225-acre preserve in south-central Wisconsin – the only place in the world that houses all 15 species of the slender, long-necked, and, in some cases, endangered birds.

Within the preserve, the ICF is creating a 5-acre refuge especially for the African Crane. All of the walking paths and observation areas in the new refuge are being paved with the FilterPave system.

Refuge designer MSA Professional Services, Inc., Baraboo, specified FilterPave for the 20,000 square feet of walkways and observation areas in the new refuge.

The pathways average about 12 feet wide, but some areas are as narrow as 6 feet wide. Nearly 1,700 linear feet of path meanders through the site.

Vinton Construction, Manitowoc, WI – a well-know concrete paving company and a certified FilterPave installer – completed about two-thirds of the pavement last fall and is returning to pave the remaining third this spring.

A Vinton representative noted that the only piece of equipment significantly different between installing concrete and FilterPave is the volumetric mixing truck.

When paving with concrete, he explained, the concrete's ingredients are measured by weight at a batch plant, then loaded into a ready-mix truck whose rotating drum mixes the concrete on the way to the project site.

FilterPave, on the other hand, uses a volumetric mixing truck that is located right on the project site and measures the mixture's key ingredients by their volumes (not weights).

The ingredients are mixed by an auger as they are propelled through the mixer's discharge chute.

The Vinton representative confirms that placing and finishing FilterPave is much like paving with concrete, except that FilterPave has an effective working time of about 15 minutes and its working strength is reached in a few hours, instead of days. ■

