

Optimizing Gravel Runways

Eliminate Dust, Build Strength, Reduce Costs

Where there is an untreated gravel runway, there is dust – harmful dust that impedes pilot vision, irritates the eyes and lungs of those on the ground, increases the need for aircraft and ground-vehicle maintenance, and threatens both the environment and your compliance with regulatory standards.

All of those problems, and we haven't even talked about damage to the runway itself yet. Treated by more traditional dust control methods or not treated at all, a runway's lifecycle is shortened, its upkeep more expensive, and its safety compromised.

Midwest's Gravel Runway Program was established to mitigate and, where possible, eliminate these problems by improving gravel runway surface integrity through a process called Fines Preservation™. We use proven, environmentally-safe products developed in our own lab to lock and bind surface aggregate fines together and prevent traffic from releasing them as dust.

Fines Preservation fast facts

- Reduces runway life cycle costs by 50%
- Raises CBR for pavement-like strength
- Reduces gravel spray and rolling resistance
- Produces a smooth, long-lasting runway
- Reduces dust by 80% for up to four years
- Saves two to five cubic meters of fines at every takeoff
- Cuts runway lifecycle costs by \$40,000 a year



Beyond dust – the plain truth about planes

Gravel runways take a severe beating under the duress of taxiing, takeoff and landing. They suffer the permanent loss of fines caused by props and jet blasts, and are ruined by potholes, rutting, and uneven surfaces. Put all these runway abuses together, and they add up to woe for those responsible for operating budgets.

Midwest's Gravel Runway Program makes runways, infield roads and perimeter roads stronger, which means they last longer because they are so much more resistant to the constant assaults made on them by the planes they are there to serve. Midwest's fines preservation products are also applied to runway shoulders, which become a source of unwanted dust when subjected to the power of jet blasts.



The bottom line: Our Gravel Runway Program increases the time periods between scheduled maintenance programs, decreasing costs over the not-so-long term. In addition, well-kept gravel runways save airlines tens of thousands of dollars annually in both maintenance and damage repair.

Northern Exposure

Because Midwest's products handle as well as they do even at the most severe temperatures, they are the natural choice for gravel runways in severe climates. Midwest has treated 40+ gravel runways in Alaska, the Yukon Territory, the Northwest Territory and Quebec.



What's wrong with traditional dust control methods?

Sometimes, nothing. For emergency dust control, there are products that will temporarily keep fines on the surface.

But for the most cost-effective long-term dust prevention, "An ounce of prevention truly is worth a pound of cure," and that is the genesis of Midwest's Gravel Runway Program.



The Midwest products used in our Gravel Runway Program, specifically EK35® and EnviroKleen®, have bonding agents in their formulas – synthetic organic in the case of EnviroKleen and organic in the case of EK35 – that you will not find in a traditional dust palliative. Treating the cause rather than the symptom, they stop fines from escaping from the surface, which not only prevents dust, but also increases runway strength, integrity, and surface life.



Fines Preservation reduces a runway's lifecycle costs by an average of 50%, or \$40,000 a year

Traditional Methods Versus Fines Preservation

Dust Palliation Products without Binders

Fines Preservation EK35 and EnviroKleen

Short term

Keeps lost fines on the surface short term so they will not escape as dust

Long term

Prevents the loss of fines in the first place by stabilizing a runway surface

Also sustains and increases runway strength and integrity, extending surface life

When a runway is in trouble...

Used when a gravel runway surface is degrading or has already failed

Generally used periodically until maintenance or rehabilitation can be scheduled or afforded

Used to prevent problems

Keeps fines bound within the surface, especially at touchdown and rotation points, for up to four years without reapplication

Pay less up front

Requires minimal initial investment

Save up to \$40,000 annually

That's a 50% reduction over the lifecycle of a gravel runway



About EK35 and EnviroKleen

The products that anchor Midwest's Gravel Runway Program:

- Are EPA-certified environmentally safe and reduce PM10 and PM2.5 particles
- Boeing-certified as non-corrosive for aircraft metals, acrylics and paints
- Can be stored at temperatures down to -50°F
- Will not wash or leach out of a gravel surface
- Perform well at extreme temperatures
- Readily biodegradable in natural environments
- Typically applied to compacted gravel or dirt surfaces

It's easy to be green

As tough as Midwest's products are at preventing and controlling dust, they have been certified safe for human, animal and plant life by the EPA's Environmental Technology Verification Program and approved by Boeing Document D6-17487, the highest standard in the aviation industry.

With chemists in our lab and experts on our customers' worksites, Midwest has the home-grown ability to manufacture products that will not harm the environment and, in many instances, will help it. Our chemists think green from source materials to formulation and from production to application.

More reasons to choose Midwest

Midwest is the world leader in environmentally sound, dust-control technology for every application where fugitive dust is a problem. We bring our customers more solutions, documentation and support than any other manufacturer. On a daily basis, we challenge ourselves to become even more accessible problem-solvers so we can set a new industry standard for proactive and responsive service. Pushing the envelope is part of our corporate DNA, and we strive, always, to develop cutting-edge processes, products and services; stay on top of the learning curve, and educate our customers for our mutual success.



Gravel runway management services that make a difference

Midwest offers these valuable fines preservation services:

- **Life Cycle Cost Analysis**

Capture maintenance data along with performance data to set a benchmark against which future results will be compared

- **Runway Structure Review**

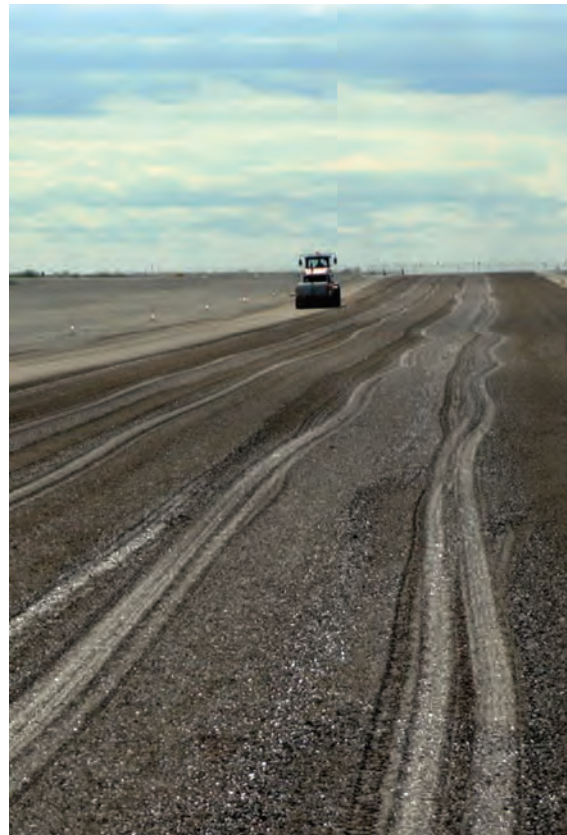
Spatially characterizes how the strength of your runway compares to the requirements for proper shape, drainage, sufficient strength and minimum gravel properties

- **Quality Control and Preventive Maintenance**

During installation and the following 48 hours, Midwest uses its Samitron® measuring device to assure uniform strength gain across a runway and make installation adjustments where anomalies exist. A minimum of 30 randomly spaced measurements are made twice during the quality control period. During the life of the runway surface, the Samitron can be used to estimate when maintenance will be need, facilitating budgeted repairs instead of reacting to surface failures



Jet exhaust from a single Boeing 737 takeoff can result in the loss of up to two cubic yards of runway material, but even considerably smaller planes damage gravel runways each time they takeoff or land.



Customizing a program specifically for you

Midwest Gravel Runway Program is based on your runway, not a generic runway. We take a sample of surface materials from your runway, and then we do our work in the lab, calculating the minimum CBR necessary to achieve safe operation. Based on the results we make a specific recommendation for your runway along with detailed application guidelines from surface preparation to maintenance and everything in-between.

Getting precise measurements – Midwest's Samitron

A non-invasive rapid way to index surface CBR, the Samitron is a precise tool that quickly measures lift stiffness and modulus on surfaces. Simply put, it measures the quality of product application and monitors the health of your runway between scheduled maintenance appointments. You will know the real-time effects of weather and traffic on your runways and be able to adjust scheduled maintenance accordingly.



Special delivery – Midwest's E-Sprayer™ System

Midwest's E-Sprayer is specifically designed for the application of Midwest products. Portable, versatile and compact, the E-Sprayer can be mounted on any light-duty truck from an F-150 flatbed one-ton trailer to a military humvee. Powered by a 4.7-hp Diesel/JP8 fuel electric-start engine and Gorman-Rupp pump, the E-Sprayer requires only one person to operate and facilitates universal application with an 8-foot spray bar. Flow is easily controlled with the throttle or motorized regulator.



Midwest's Gravel Runway Program reduces dust by 80% for up to four years.

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