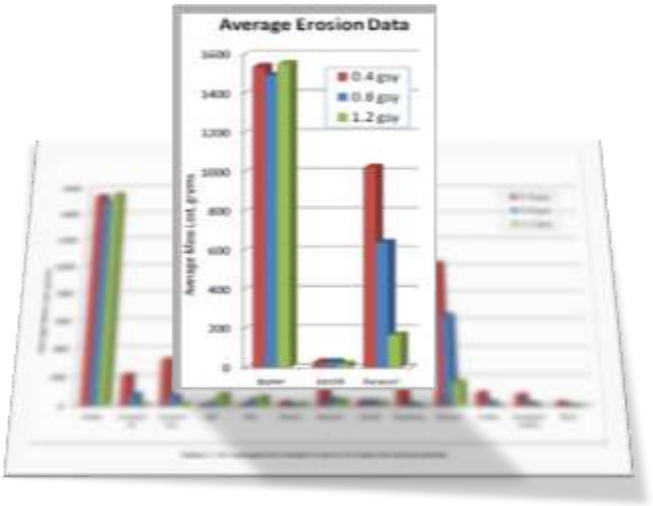
Unmatched Performance with Binder System (Lab)

Overview:

Midwest's Semi-Permanent Gravel Runway system is achieved using a synthetic fluid and binder system. The binder system is what separates the Semi-Permanent Gravel Runway system's long-term performance from the short-term temporary dust palliatives on the market. Midwest's system has demonstrated unmatched performance in the field and in the lab.

The U.S. Army Corps of Engineers conducted laboratory testing under simulated flight conditions to evaluate the performance of several dust abatement products. During this study, two synthetic fluids were tested and evaluated. One of the synthetic fluids contained a binder system (EK35) and the other did not (Durasoil®). Below is a comparison of each products ability to resist surface erosion and reduce dust emissions under simulated flight conditions.

Test Results:

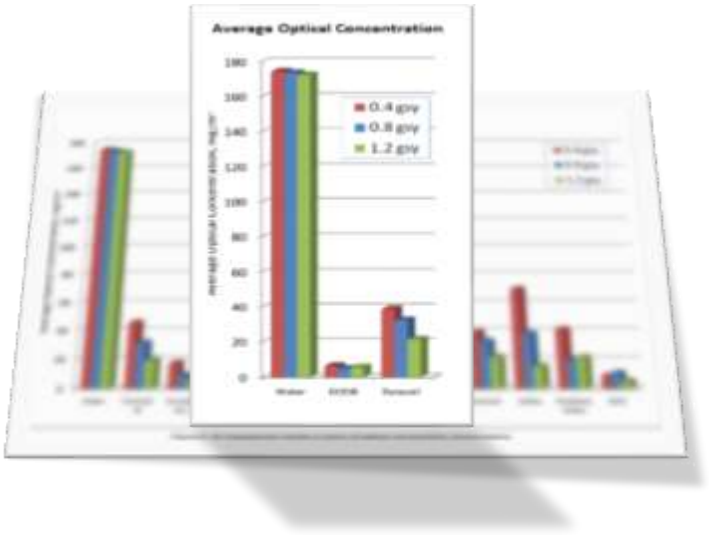


<u>EK35 % reduction in erosion compared to water:</u>

- **0.4gsy = 98.1%**
- 0.8gsy = 98.1%
- 1.2gsy = 98.5%

<u>Durasoil® % reduction in erosion compared to water:</u>

- 0.4gsy = 33.5%
- 0.8gsy = 58.4%
- **1.2gsy = 82.5%**



<u>EK35 % reduction in optical concentrations compared to water:</u>

- **0.4gsy = 96.2%**
- 0.8gsy = 97.1%
- 1.2gsy = 96.7%

<u>Durasoil® % reduction in optical concentrations compared to water:</u>

- 0.4gsy = 77.7%
- 0.8gsy = 81.2%
- **1.2gsy = 87.4%**

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Conclusion: There is a significant difference in the performance of EK35, a synthetic fluid and binder system, compared to a binderless synthetic fluid (Durasoil®). Under simulated flight conditions, EK35 performance is unmatched by the binderless synthetic fluid even when 3 times the volume of binderless synthetic fluid is used.

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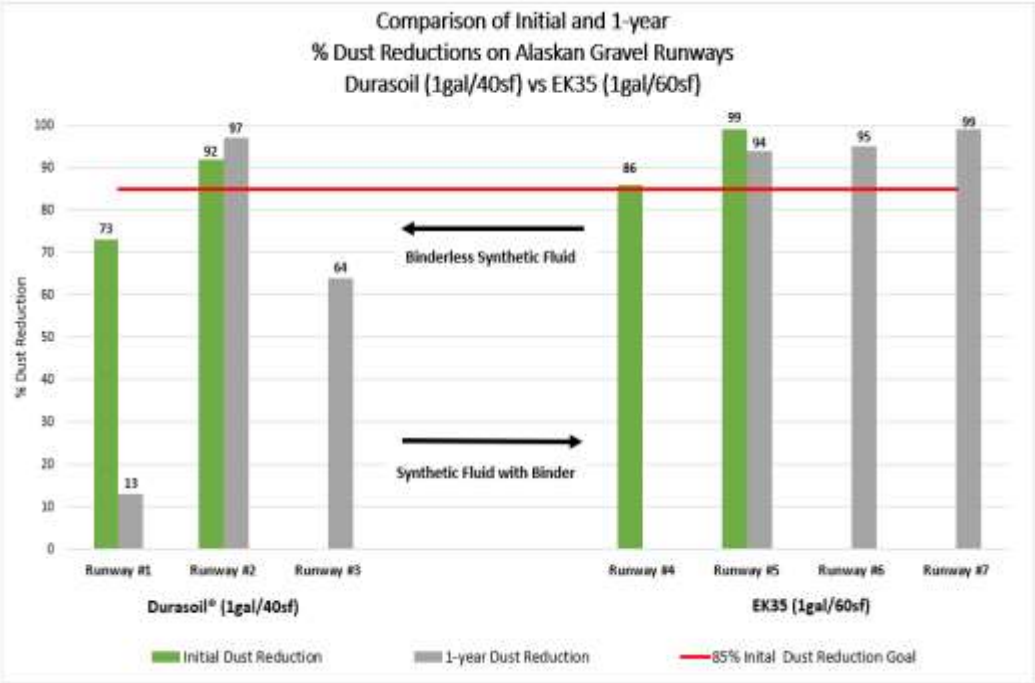
The University of Alaksa Fairbanks (UAF) and the Alaska Unversity Transportation Center (AUTC) performed field testing at 21 different Alaskan runways between 2009 and 2012 to evaluate the perfomance of 3 dust palliatives. UAF and AUTC used a Dust-M real-time dust monitor mounted on the rear of an ATV to perform dust emissions testing on the runways. Data obtained from treated runways was compared to data collected prior to treating the runways to determine the percent dust reduction over time.

Test Results:



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Conclusion: The results shown in the chart above indicate that EK35 at an application rate of 1 gallon per 60 square feet outperfomred Durasoil® (binderless synthetic fluid) which was applied at 1 gallon per 40 square feet. All runways treated with EK35 at 1 gallon per 60 square feet achieved the 85% dust reduction goal even after 1 year of traffic. However, only 1 of the 3 Durasoil® runways treated at 1 gallon to 40 square feet achieved a 85% dust reduction. These results demostrate that a sythetic fluid and binder outperforms a binderless synthetic fluid even when 50% more binderless synthetic fluid is used.

Midwest Industrial Supply, Inc.
1101 3rd Street Southeast
Canton, Ohio 44707
www.midwestind.com

Tel 330.456.3121
Fax 330.456.3247
Toll Free 1.800.321.0699

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