

Environmental Perspective

EK35

Overview

Midwest was founded in 1975 to deliver solutions to help customers solve environmental issues. Today, that mission continues, but the emphasis has shifted. The environmental solution starts long before the application of the product – it starts in the lab. Product development begins with the environment in mind, continues with rigorous ecotoxicological impact testing, and finishes with flawless delivery and application.

Selection of the right product for your installation involves more than looking at the lowest cost or best control performance. The selection process is different for every customer and every installation. Midwest takes a holistic approach to product selection. Performance, value, regulatory constraints, operational concerns, climate, customer preferences, and environmental and health and safety impact are all components of that decision.

There is no regulation that dictates what a dust suppressant or stabilization agent should or should not contain. We do not feel that customers should rely on the “word” of the vendor that their product is “safe”. Midwest has sought out numerous regulatory bodies and experts on environmental impact to develop a best practice for determining potential environmental impact for chemical dust suppressants and stabilization agents.

Best practice includes understanding of site requirements, unblemished installation, and transparent knowledge of product being applied. Part of the transparent knowledge is comprehensive ecotoxicity data. This information includes:

- SDS review
- Bulk analysis
 - o Volatiles EPA 8260
 - o Semi Volatiles EPA 8270
 - o TCLP (toxicity characteristic leaching procedure EPA 1311)
- Aquatic toxicity various EPA methods
 - o Ceriodaphnia dubia, acute and chronic (water flea)
 - o Pimephales promelas, acute and chronic (fathead minnow)
 - o Oncorhynchus mykiss, acute and chronic (rainbow trout)
 - o Mysisopsis bahia, acute and chronic (mysid shrimp)



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Midwest works with third party laboratories to perform testing on our products. All testing is completed on the “as received” chemical. Test data is attached for your review. Interpretation of the data is the real challenge. What does this mean, how will this chemical impact my operations, etc?

The EPA has provided two methods to put the data into perspective. Regional Screening Level (RSL) tables for assessing bulk analysis and EPA guidelines for screening aquatic toxicity.

Constituents detected in bulk analysis are compared to levels in the tables of “United States Environmental Protection Agency, Regional Screening Levels for Chemical Contaminants at Superfund Sites (Nov. 2021) <https://www.epa.gov/risk/regional-screening-levels-rsls> .

The RSL tables compare values of exposure of numerous hazardous chemicals in various media: residential soil, industrial soil, air, drinking water and ground water. Midwest uses this data and compares it to bulk analysis results as well as calculated levels in residential soil (calculations are based on typical application rate of chemical to the soil). This data is attached in the following pages.

The second method of evaluation uses the EPA guidelines for LC₅₀ (lethal concentration in 50% of population), suggested toxicity criteria for materials.

LC ₅₀ (mg/L)	Category Description
<0.1	Very highly toxic
0.1 – 1	Highly toxic
1 – 10	Moderately toxic
10 –100	Slightly toxic
>100	Practically non-toxic

Third Party Verification

In 2005 Midwest received US EPA ETV (Environmental Technology Verification) for EK3[®] under the Dust Suppressant Protocol. The program was unique because it looked at not only performance, but potential environmental impact.

The EPA tested and verified results for an array of chemical and toxicity test as well as PM10 and PM2.5 control efficiencies. The EPA ETV verification statement verifies the effectiveness of EK35[®] to control dust on unpaved roads. The program did not comment on chemical and aquatic toxicity test results. However, if the results were outside of EPA permissible limits indicating a potential for negative environmental impact the verification would not been granted.

Test results and the report are available upon request.



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Chemically, EK35® is a patented synthetic fluid. It is produced by a reaction of specific purified chemical feedstock that is treated via extreme heat, pressure, and catalyst during hydrocracking, hydrotreating and hydroisomerization to create a synthetic iso-alkane. Further formulating and blending with naturally occurring rosins impart the rheological and cohesive properties unique to EK35®. EK35® is a non-aqueous liquid that is not water soluble or dilutable.

Application rates vary with soil type and properties and the desired result of the project. EK35® is applied with specially designed applicator trucks. It can be applied topically to the surface or applied to graded, loose material and blended and compacted into the roadbed.

Bulk Analysis

Bulk analysis and TCLP testing were performed on concentrated “as received” EK35®. Calculation for soil levels of EK35® were based on an application rate of 0.40 gal/yd², one (1) inch depth of penetration and a soil density of 2.8 g/cm³. Calculated chemical levels in the soil were compared to the EPA RSL tables for residential soil (Nov 2021).

Constituent detected	Result (mg/kg)	as applied soil level (mg/kg)	RSL residential soil (mg/Kg)
Aluminum	1.2500	0.0320	77,000
Cadmium	0.0440	0.0011	71
Copper	0.0440	0.0011	3100
Iron	31.8000	0.8080	55,000
Manganese	0.1600	0.0040	1800
Silver	1.0300	0.0008	390
Zinc	0.1420	0.0036	23,000

Tri State Laboratories, July 2002, and Feb. 2010

TCLP (Toxicity Characteristic Leaching Procedure) is designed to determine the mobility of both organic and inorganic analytes present in a product. It simulates landfill conditions. Over time water and other liquids percolate through the soil and the resultant leachate may pose environmental or human health risks. The EPA determines which contaminants to test for that may pose a risk and the level at which the constituent is hazardous.



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Constituent detected	Result (mg/L)	TCLP Regulatory Level (mg/L)
Barium	0.151	100

Cardinal Environmental Labs, Nov. 2021

All detected constituents were detected at levels 600 times or more lower than the cited regulatory levels. These elements are present in many naturally occurring materials. The binder system in EK35 is from a naturally occurring plant-based material and it is unreasonable to assume that no naturally occurring constituents would be present.

Aquatic Analysis

Aquatic testing was performed on “as received” EK35®. Testing shows that in the concentrated form EK35® has an EPA toxicity rating of slightly toxic to practically non-toxic. This testing demonstrates “worst case catastrophic scenario” and does not portray the typical application.

Aquatic species	acute LC ₅₀ (mg/L)	chronic NOEC (mg/L)
C. dubia (water flea)	93.61	50
P. promelas (fathead minnow)	>100	100
O. mykiss (rainbow trout)	70.71	50
M. bahia (mysid shrimp)	>1000	100

EnviroScience Labs, Dec. 2021

In conclusion, all testing shows EK35®, when applied properly, will not negatively impact soil quality. Aquatic toxicity testing of EK35® shows a range of toxicity from practically non-toxic to slightly toxic depending on the species and the exposure time. This information is critical in determining the suitability of EK35® for an application. Generic risk assessment will not replace a conscientious site-specific evaluation, but the data used in this perspective is a necessary component for all risk assessments.

Sincerely,

Cheryl Detloff
Dir. EHS and Quality



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