



Soil-Sement® Engineered Formula

Road Construction & Stabilization System

What is Soil-Sement® Engineered Formula?

Soil-Sement® Engineered Formula Road Construction and Stabilization System creates an impenetrable, durable surface with superior compressive strength!

Soil-Sement® Engineered Formula is a high performance, critical application polymer emulsion designed to give exceptional dry strength and exceptional wet strength properties to road or sub-base engineered design and installation procedures.

Soil-Sement® Engineered Formula is a special product that creates an engineered stabilized 7 to 25 cm layer with unique superior strength for roadways. Soil-Sement® Engineered Formula prepares sub grade for chip seal, paving, and milling applications.

Why Soil-Sement® Engineered Formula works?

- ❖ Is easily installed and requires minimal equipment and personnel.
- ❖ Can be installed in a wide range of ambient temperatures and conditions with the expected level of performance.
- ❖ Has a short cure time.
- ❖ Can be used on base material with a wide range of gradation in either plastic or non-plastic materials.
- ❖ Has water-resistant properties and resists moisture damage.
- ❖ Has a long life cycle and minimizes maintenance and repair. This will cut rolling resistance; reduce tire wear and maintenance costs for power train, suspension and brake systems.
- ❖ Resists potholes, heaving, pushing and channeling under vehicle wheel pass.
- ❖ Is cost effective and able to provide the engineered performance necessary for extreme traffic conditions.
- ❖ Creates an impenetrable, durable surface with superior compressive strength.

What is the Design?

As part of the design, ICG in collaboration with the product Manufacturer provides complete engineering services including laboratory analysis of native soils and materials, and product volumes, optimum moisture determination, water mix ratio, and blending design to provide optimum compaction and desired density and strength. Where and as appropriate, Soil-Sement® Engineered Formula is custom formulated for performance to the site specific factors. A complete analysis of the soil is conducted including: Determination of particle distribution, Plasticity and Optimum moisture.

Recommendations are provided by our state-of-the-art laboratory targeting the most cost-effective application meeting the desired performance criteria.

How is Soil-Sement® Engineered Formula installed?

During installation, among the factors are controlled to assure the maintenance performance specifications include:

- Test of the resilient modulus and stiffness
- Monitoring and testing during installation for specified results
- Compaction
- Moisture content

What are the benefits of Soil-Sement® Engineered Formula?

- ◆ Prevents surface deterioration against potholes, wash boarding, rutting and areas break-up
- ◆ Provides a cumulative effect and creates a stabilized surface which will not shift or sink
- ◆ Offers maximum weather ability of the road surface in all weather conditions
- ◆ Increases load-bearing strength of all types of surfaces
- ◆ Environmentally friendly
- ◆ Enhances overall performance by not tracking
- ◆ Provides a solid, cohesive polymer bound road surface which withstands traffic, loading abuses and extreme temperatures
- ◆ Creates a smooth road which allows for better fuel efficiency and higher productivity
- ◆ Minimizes airborne asphalt particles
- ◆ Reduces road maintenance

Soil-Sement® Engineered Formula
Is proudly distributed in Africa and in Brazil by
International Commerce Group, Inc.

SOIL SEMENT[®] ENGINEERING FORMULA

ROAD CONSTRUCTION &
STABILIZATION SYSTEM



SOIL~ SEMENT® ENGINEERING FORMULA

ROAD CONSTRUCTION &
STABILIZATION SYSTEM

What is Soil~Sement® Engineering Formula

Soil~Sement® Engineering Formula is a special product that creates an engineered stabilized 7 to 25 cm layer with unique superior strength for roadways. Soil~Sement® Engineering Formula prepares subgrade for chip seal, paving, and milling applications.

Soil~Sement® Engineering Formula-Why it Works

Soil~Sement® Engineering Formula is easily installed and requires minimal equipment and personnel.

Soil~Sement® Engineering Formula can be installed in a wide range of ambient temperatures and conditions with the expected level of performance.

Soil~Sement® Engineering Formula has a short cure time.

Soil~Sement® Engineering Formula can be used on base material with a wide range of gradation in either plastic or non-plastic materials.

Soil~Sement® Engineering Formula has water-resistant properties and resists moisture damage.

Soil~Sement® Engineering Formula has a long life cycle and minimizes maintenance and repair. This will cut rolling resistance; reduce tire wear and maintenance costs for power train, suspension and brake systems.

Soil~Sement® Engineering Formula resists potholes, heaving, pushing and channeling under vehicle wheel pass.

Soil~Sement® Engineering Formula road construction & stabilization system is cost effective and able to provide the engineered performance necessary for extreme traffic conditions.

Soil~Sement® Engineering Formula road construction & stabilization system creates an impenetrable, durable surface with superior compressive strength.



Soil~Sement® Engineering Formula provides superior bonding and long term stability. Load bearing capacity is increased by up to 500%.

Soil~Sement® Engineering Formula increases the CBR strength 25% to 200%. R-Value is increased 25% to 200%.



Soil-Sement® Engineering Formula includes a total package consisting of Midwest Industrial Supply, Inc.'s design, installation, post installation performance testing, and Quality Assurance and Verification Program.

Design

As part of the design, Midwest Industrial Supply, Inc. provides complete engineering services including laboratory analysis of native soils and materials, and product volumes, optimum moisture determination, water mix ratio, and blending design to provide optimum compaction and desired density and strength. Where and as appropriate, Soil-Sement® Engineering Formula is custom formulated for performance to the site specific factors.

A complete analysis of the soil is conducted including:

- Determination of particle distribution
- Plasticity
- Optimum moisture

Recommendations are provided by our state-of-the-art laboratory targeting the most cost-effective application meeting the desired performance criteria.

Installation

During installation, among the factors are controlled to assure the maintenance performance specifications include:

- Midwest Industrial Supply Inc.'s Samitron® is used to test the resilient modulus and stiffness
- Monitoring and testing during installation for specified results
- Compaction
- Moisture content

Post Installation

- Midwest Industrial Supply, Inc.'s Samitron® is utilized to perform non-destructive testing with real-time results. Testing will confirm specified target measures assuring performance results of stiffness, modulus, and CBR values utilizing Midwest Industrial Supply Inc.'s Samitron®.

BENEFITS OF

SOIL~SEMENT® ENGINEERING FORMULA

ROAD CONSTRUCTION &
STABILIZATION SYSTEM

- Prevents surface deterioration against potholes, washboarding, rutting and areas break-up
- Provides a cumulative effect and creates a stabilized surface which will not shift or sink
- Offers maximum weatherability of the road surface in all weather conditions
- Increases load-bearing strength of all types of surfaces
- Environmentally friendly
- Ease of equipment cleanup
- Enhances overall performance by not tracking
- Provides a solid, cohesive polymer bound road surface which withstands traffic, loading abuses and extreme temperatures
- Creates a smooth road which allows for better fuel efficiency and higher productivity
- Minimizes airborne asphalt particles
- Reduces road maintenance



Midwest Industrial Supply, Inc.

Locations

We operate manufacturing and warehouse facilities with satellite operations located across the United States, Canada and Europe. We provide a complete research and development lab, a computerized office and administrative division, central dispatch center, and a worldwide sales and service organization.

Customer Service

We work individually with each customer to develop the subgrade Stabilization program that addresses your specific needs and requirements. Complete location surveys, soil evaluations, review of state and local air quality regulations, and other critical data are all combined as part of our detailed proposals and control plans. This determines the products, services, equipment, personnel, application schedules and budgets needed to do the job right.

Application

We offer complete turn-key application services. We serve our customers with a full-time fleet of properly equipped spray trucks and operators who are highly trained and professionally qualified. We provide field application services 24 hours a day, 7 days a week. Our computerized central dispatch center maintains constant communications with the field operators for prompt routine service and immediate response to any emergency situation.

Recordkeeping and Reporting

We collect site, product, and application specific data in the field and create required daily reports which form the basis for the comprehensive, self-monitoring program needed for air quality compliance. Our computerized, administrative staff compiles required records of your dust and erosion control program and issues detailed quarterly and annual reports. These reports are prepared for presentation to state regulatory agencies for compliance with Title V certification provisions of the Clean Air Act and each state's air quality regulations.



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S O I L - S E M E N T[®]
ENGINEERED FORMULA

Dust and Erosion Control Agent

MATERIAL SAFETY DATA SHEET

SECTION I -- IDENTIFICATION OF SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

TRADE NAME: SOIL-SEMENT[®] ENGINEERED FORMULA
CHEMICAL NAME: POLYMER EMULSION
SYNONYMS: DUST RETARDANT
CHEMICAL FAMILY: N/A
MOLECULAR WEIGHT: N/A
FORMULA: AQUEOUS ACRYLIC VINYL ACETATE POLYMER EMULSION
CAS REGISTRY NO.: PRODUCT A BLEND - NO NUMBER ASSIGNED

SECTION II -- COMPOSITION/INFORMATION ON INGREDIENTS

<u>NAME</u>	<u>CAS REG NO.</u>	<u>WT. %</u>
Acrylic & Vinyl Acetate Polymer	Non-hazardous	5-50
Water	7732-18-5	95-50

SECTION III -- HAZARDS IDENTIFICATION

Acrylic & Polyvinyl Acetate Polymer	Non-hazardous
Water	Non-hazardous

SECTION IV -- FIRST AID MEASURES

EYES: Flush eyes with flowing water at least 15 minutes, get medical attention.
INHALATION: Move subject to fresh air.
SKIN: Flush with large amount of water or wash with soap and water.
INGESTION: Give water to drink. Call a physician.

NEVER GIVE FLUIDS OR INDUCE VOMITING.

IF PATIENT IS UNCONSCIOUS OR HAVING CONVULSIONS.

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SECTION V -- FIRE FIGHTING MEASURES

FLASH POINT (TEST METHOD): Non-Combustible
AUTOIGNITION TEMPERATURE: N/A
EXTINGUISHING MEDIUM: N/A
SPECIAL FIREFIGHTING PROCEDURES: N/A
UNUSUAL FIRE AND EXPLOSION HAZARDS: Material can splatter above 212°F. Dried polymer film can burn but will not support combustion.

SECTION VI - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES:
Dike and control spill. Transfer liquid to containers for recovery or disposal. Keep spills out of sewers and open bodies of water.

SECTION VII -- HANDLING AND STORAGE

STORAGE: Keep in a cool, dry, ventilated storage area and in closed containers. Avoid freezing temperatures. Minimize contact with the air to prevent microorganism contamination and reduce the formation of skins on the surface.
HANDLING: Handle in a well-ventilated workspace.

SECTION VIII -- EXPOSURE CONTROL/PERSONAL PROTECTION

RESPIRATORY PROTECTION: None required if good ventilation is maintained.
VENTILATION: Mechanical exhaust at point of contaminant.
EYE PROTECTION: Chemical splash goggles recommended.
PROTECTIVE CLOTHING: Impervious gloves recommended.
OTHER: Under normal handling conditions, the risk of exposure to residual monomer is negligible.

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SECTION IX -- PHYSICAL AND CHEMICAL PROPERTIES

BOILING/MELTING POINT @ 760 mm Hg:	212°F
VAPOR PRESSURE mm Hg @ 20°C:	17
SPECIFIC GRAVITY OR BULK DENSITY:	1.01 to 1.15
SOLUBILITY IN WATER:	Dilutable
APPEARANCE:	Milky White Liquid
ODOR:	Characteristic Acrylic odor
pH:	4.0 to 9.5

SECTION X -- STABILITY AND REACTIVITY

STABILITY:	Stable
CHEMICAL INCOMPATIBILITY: normal	No hazardous reactions are expected to occur under industrial conditions.
HAZARDOUS DECOMPOSITION PRODUCTS:	Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide and water.
HAZARDOUS POLYMERIZATION:	Does not occur
CONDITIONS TO AVOID:	N/A
CORROSIVE TO METAL:	No
OXIDIZER:	No

SECTION XI -- TOXICOLOGICAL INFORMATION

EFFECTS OF OVEREXPOSURE

INHALATION:	Vapor from stored, undiluted product can cause headache and nausea.
SKIN:	Stored, undiluted product is slightly irritating to skin.
EYES:	Slightly irritating to eyes.
INGESTION:	May be irritating to digestive tract.

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<u>NAME</u>	<u>OSHA</u>		<u>ACGIH</u>	
	TWA	STEL	TWA	STEL
Acrylic & polyvinyl Acetate Polymer	None	None	None	None
Water	None	None		None

SECTION XII -- ECOLOGICAL INFORMATION

Toxicological evaluation of Soil Sement[®] Engineered Formula utilized EPA methods for both acute and chronic toxicity determination for aquatic organisms. LC₅₀ values were determined for each of the species. The table below contains a synopsis of the results.

Soil Sement Engineered Formula Aquatic Toxicity Test Results

*Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, EPA/600/4-90/027F.

*Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002.

*Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms, EPA/600/4-91/003.

	Ceriodaphnia dubia	Fathead minnow	Americamysis bahia	Rainbow trout
ACUTE/SURVIVAL (mg/L)				
LC50	>1000	>1000	>1000	320
NOEC	1000	1000	1000	
LOEC	>1000	>1000	>1000	
CHRONIC/SURVIVAL (mg/L)				
LC50	>1000	>1000	>1000	510
NOEC	1000	1000	1000	340
LOEC	>1000	>1000	>1000	700
CHRONIC/GROWTH/ REPRODUCTION (mg/L)				
LC50	>1000	>1000	>1000	540
NOEC	1000	1000	1000	340
LOEC	>1000	>1000	>1000	700

See attached test results:

1. ABC Laboratories, Inc. Americamysis bahia, Fathead minnow, Ceriodaphnia dubia.
2. BAR Invironmental, Inc. Rainbow trout
3. EnviroScience Inc. Rainbow Trout, Chronic (New Data)

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LC50 - Lethal Concentration, 50%
NOEC - No Observable Effects Concentration
LOEC - Lowest Observable Effects Concentration

Comparison of the EPA guidelines to the LC₅₀ levels of all species show that Soil Sement[®] Engineered Formula is practically non-toxic to all species.

SECTION XIII -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:

Coagulate the emulsion by the stepwise addition of ferric chloride and lime or the addition of sand or other absorbent material. Remove the clear supernatant liquid and flush to a chemical sewer or landfill. Incinerate solids and the contaminated diking material according to local, state and federal regulations.

CONTAINER DISPOSAL:

Do not re-use containers. Do not weld on metal containers.

SECTION XIV -- TRANSPORTATION INFORMATION

D.O.T. PROPER SHIPPING NAME (49CFR172.101):	None
HAZARDOUS SUBSTANCE (40CFR116):	N/A
REPORTABLE QUANTITY (RQ):	N/A
D.O.T. HAZARD CLASSIFICATION (49CFR172.101):	Non-regulated
D.O.T. PLACARDS REQUIRED:	None
POISON CONSTITUENT (49CFR173.343):	N/A
BILL OF LADING DESCRIPTION:	Liquid plastic, NOS
C NO.:	N/A
UN/NA CODE:	N/A

SECTION XV-- REGULATORY INFORMATION

SOIL-SEMENT[®] ENGINEERED FROMULA is not a restricted article according to the Department of Transportation and International Air Transport Association regulations.

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EPA SARA Title III hazard class:

None

OSHA HCS hazard class:

Non-OSHA hazardous (29CFR1910.1200)

Toxic Chemicals present in quantities greater than the “de minimus” level are:

None

TSCA:

All ingredients are on the TSCA (Toxic Substance Control Act) inventory or are not required to be listed on the TSCA inventory.

California Proposition 65:

This product contains no trace amount of chemical(s) know to the state of California to cause cancer of birth defects.

Canadian DSL:

All ingredients are in the Canadian DSL (Domestic Substance List) or are not required to be on the list.

Canadian WHMIS:

This product is not a “controlled product” under the Canadian Workplace Hazardous Material System (WHMIS)

Information

SECTION XVI -- OTHER INFORMATION

ABBREVIATIONS AND SYMBOLS:

N.D. - Not Determined

N.A. - Not Applicable

N.T. - Not Tested

< - LESS THAN

> - MORE THAN